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ABSTRACTS

(The titles which are set in bold-face are intended as "scanning titles" for ease in classifying and filing. Where these are not substantially the authors' titles the exact titles are set in parentheses.)

1—FIBRES AND THEIR PRODUCTION

Textile Fibers. L. E. Parsons and John K. Stearns. Scranton (U.S.A.): International Textbook Co., 1951, ix+90+50+73+71+ix pages. This book is divided into four sections: the first deals with the production of cotton, and its properties; the second with wool; and the third with man-made fibres; the fourth describes briefly the production and characteristics of different kinds of yarns produced from these fibres. C—1.

(B)—ANIMAL

Regenerated Silk: The Technical Possibilities. Helmut Wakeham, R. K. Toner, H. R. Jolley, and H. S. Taylor. *Text. Res. J.*, 1951, 21, No. 2, pp. 110-115. Methods and problems involved in the regeneration of a good "silky" fibre from solutions of silk fibroin are discussed. Although the molecular structure and properties of silk should make it superior to all other proteins for making a regenerated fibre, the regenerated fibres made so far do not compare in quality with either natural silk or other protein fibres, notably casein fibres. There are thirteen references. C—1B.

Sheep: The Panama [Breed]. S. W. McClure. *Nat. Wool Grower*, 1951, 41, No. 5, 14-15, 36. The Panama is one of the two sheep breeds founded in the U.S.A. It is derived from Rambouillet rams and Lincoln ewes. Its evolution is described. W—1B.

Weathering of Wool. G. S. Mahal and R. H. Burns. *Nat. Wool Grower*, 1951, 41, No. 4, 12-13, 31-32. The effect on wool of rain, humidity, light, temperature, and soil is described. Measures to combat weathering are briefly indicated. W—1B.

Sheep Lice and Ked: Fogging for control. G. J. Shanahan. *N.S.W. Agric. Gaz.*, 1951, 62, 229-232 and 276-278. Using DDT and BHC, the New South Wales Department of Agriculture recently carried out a fogging experiment in which it was shown that fogging of heavily infested sheep failed to give satisfactory control of sheep lice. The trial did not provide a definite conclusion concerning the value of fogging against sheep ked. W—1B.

Sheep Dips. ("A Hundred Years of Lime-sulphur.") F. G. Ordish. *Agriculture*, 1951, 58, 111-115. The history is given of the development of lime-sulphur and of its use as a sheep dip. The possibilities of substitutes which use less sulphur are briefly discussed. W—1B.

Sheep Scab in Britain: Control. T. Spence. *N.Z. Conference Paper*, 1951 (through *Austral. Vet. J.*, 1951, 27, 136-146). Difficulties encountered in the eradication of sheep scab in Britain are examined in an attempt to explain why the disease has lingered in Britain while it has been extinct in New Zealand half a century. Legislation and administration, inefficient dips and badly supervised dipping are discussed and figures are given to show that final eradication may be in sight. Research is discussed with reference to biology of the parasite and dipping and insecticides, *e.g.* benzene hexachloride (Gammexane). W—1B.

Sheep (Grazing): The Effect of Level of Nutrition during Pregnancy and during Lactation on Lamb and Wool Production. I. E. Coop. *J. Agric. Sci.*, 1950, 40, 311-340. Large-scale experiments on the effect of the level of nutrition on the lamb and wool production of freely-grazing sheep are reported. The trials were run as nearly as possible under typical fat-lamb producing conditions. Wool production was influenced by the level of nutrition to a much greater extent during pregnancy than during lactation. W—**1B.**

Sheep Branding Fluids Removable by Scouring. M. Lipson. *Austral. J. Appl. Sci.*, 1951, 2, 200-204. Experiments have been undertaken to devise a branding fluid which will remain on sheep for a year and then be removed during the normal wool-scouring process. Satisfactory products have been developed using pigmented aqueous preparations of lanolin, rosin, and stearic acid with ammonium stearate as emulsifying agent. The importance of the type of pigment used and the effects of variations in the proportions of ammonia, rosin, and stearic acid are discussed. W—**1B.**

Sheep Blowfly Problem in Queensland. (5) Modern Methods of Blowfly Control. S. J. Miller. *Queensland Agric. J.*, 1951, 73, 1, 51-60. A review to enable the wool-grower to arrange an adequate control programme. It is stressed that the grazier should anticipate fly attack and the first chapter deals with long-term preventive measures, namely, correct docking, the Mules operation and the tail-strip operation. There is a chapter on temporary measures to be adopted shortly before an attack is likely; these measures, *viz.*, shearing, crutching and, if necessary, jetting should, it is suggested, be taken in addition to those mentioned above. Despite precautions, some strikes may occur and a third section deals with treatment of affected sheep. W—**1B.**

Sheep: Branding. J. E. Duncan and R. G. Montgomery. *Massey Agric. Coll., Sheepfarming Annual*, 1950, 79-91 (9 pp.). The problem of wool branding is discussed, with special reference to the legislative position in New Zealand. W—**1B.**

(C)—VEGETABLE

Cotton Production, Marketing and Utilisation. W. B. Andrews (Editor). Published by W. B. Andrews, State College, Mississippi, 1950, viii+476 pages. This book relates essentially to American practice. The different chapters by different contributors, concern production (a review of statistics for the period 1800-1949), varieties and breeding, response to fertilizers, diseases, cultivation, insect control, harvesting, ginning, warehousing, fibre technology (testing), classing, marketing, processing, utilisation, world trade, and cottonseed. C—**1C.**

Farm Mechanization Research in the South. Grady B. Crowe. *Agric. Econ. Res.*, 1951, 3, No. 1, pp. 1-7. Economic research, and some of the findings in regard to farm mechanisation in the cotton areas of the South (U.S.A.), are summarised. The value of such aids as the all-purpose tractor, flame cultivation and chemical weed control, and the mechanical harvesting of cotton, are assessed in their relation to efficient production of cotton. C—**1C.**

Insects and Insecticides in the Cotton Campaign 1948-49. Anon. *Agronomia* (Peru), 1949, 14, No. 58, pp. 46-52 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10250[d]). Toxaphene was found to control *Anomis* for 20-30 days but was ineffective against *Aphis*, *Heliothis* and other insects. *Heliothis* was controlled by mixtures of DDT and Gammexane or DDT and calcium arsenate. *Anomis* was also controlled by DDT with Gammexane and sulphur, whilst the two latter alone controlled *Aphis*. Experiments with parathion and insecticide mixtures are also reported. C—**1C.**

Spraying and Dusting for Cotton Insect Control. F. A. Fenton. *J. Econ. Entomol.*, 1950, 43, pp. 292-294 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10250[h]). Aeroplane spraying of cotton with a toxaphene-DDT emulsion (40-20 per cent.) controlled boll weevil and bollworm. Control compared favourably with that obtained by dust applied with a ground machine. C—**1C.**

Insecticides for Control of Cotton Insects during 1949: Tests. R. L. Hanna and J. C. Gaines. *J. Econ. Entomol.*, 1950, 43, pp. 288-292 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10250[e]). Several insecticides in various combinations were tested in cotton field plots in Texas, U.S.A., for potency against bollworm and boll weevil. C—**1C.**

(D)—ARTIFICIAL

Carbon Disulphide Recovery in the Viscose Rayon Process. Theodor Kleinert. *Textil-Rdsch.*, 1951, 6, No. 6, pp. 276-280. In German. A survey is made of various methods of recovering carbon disulphide from either staple or continuous filament viscose rayon. C—1D.

Viscose: New Pulps Used in the Industry. Richard Bartunek. *Das Papier*, 1950, 4, pp. 451-455 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4444[b]). Recent developments in the properties of textile-rayon pulps and tyre-cord pulps are outlined in a lecture. The use of such raw materials as beech, aspen, and southern pine are discussed, together with various cooking and bleaching procedures and methods of purification. C—1D.

Polyamide Ribbon-Spinning Processes. Hermann Klare. *Faserforsch. u. Textiltech.*, 1951, 2, No. 4, pp. 131-140. In German. A detailed description is given of the principles involved, apparatus required for, and the difficulties which arise in, the production of continuous filament yarns from profiled (shaped) and flat ribbons of caprolactam polymerisates. The aim of the profiled ribbon process is to produce a filament of regular denier from a melt without recourse to a pump at the spinneret. This is done by regular feeding of the ribbon into a tube of profile complementary to that of the ribbon, the lower part of the tube (the part immediately above the spinneret) forming a melting chamber. The oncoming molten ribbon acts as a continuous die. In the present early stages of development, the resulting filament is suitable only for weaving purposes, since imperfect ribbon-casting technique gives rise to filament denier fluctuations of $\pm$10 per cent. The flat ribbon process is a variation of the foregoing system, an auxiliary pump being included immediately prior to the spinneret. In this case, the extruded filament is converted to a staple fibre, so as to compensate for irregularity of count, and to permit removal of low molecular caprolactam polymerisates prior to yarn and fabric manufacture. C—1D.

Size Reduction in Rayon Manufacture. F. H. Slade. *Text. Mfr*, 1951, 77, March, pp. 128-131. An illustrated review is given of some of the crushing, grinding, and cutting machinery used in the rayon industry for the disintegration of materials. C—1D.

Cellulose from Topinambar. Bernardino Angeli and Sergio Magza. *Chimica* (Milan), 1951, 6, pp. 25-27 (through *Chem. Abstr.*, 1951, 45, No. 12, p. 5404[e]). The fresh stems and small branches of *Helianthus tuberosus* and *H. macrophyllum*, were found on analysis to contain 14·00 and 7·08 per cent. of cellulose respectively. The soda-chlorine process gave a pulp useful for certain types of paper. An inorganic analysis was made of the stem ash. C—1D.

Viscose: Filtering Properties. V. O. Samuelson. *Svensk Papperstidn.*, 1950, 53, pp. 397-401 (through *Brit. Abstr.*, 1951, **B II**, January, p. 71). Methods for the determination of the filterability of viscose are discussed in the light of Hermans and Bredée's theory. By choosing a suitable filtering material, the testing method of the German Chemical Fibre Production Group is found to agree well with other methods with viscoses which give appreciable plugging. C—1D.

Viscose Spinning: Promotion of the Decomposition of Xanthate. Shunji Taruishi, Fumio Kobayashi, Nokunori Miyamoto, and Mamoru Okinaka. *Bull. Research Inst. Teikoku Jinzo Kenshi Kaisha Ltd.*, 1949, 1, No. 1, pp. 24-34 (through *Chem. Abstr.*, 1951, 45, No. 1, p. 359[e]). The decomposition of xanthate, determined within two seconds after spinning, was found to be proportional to the time in the bath, the denier of a single thread, and the sulphuric acid concentration in the bath, but inversely proportional to the sodium sulphate and zinc sulphate concentration in the bath. A rapid decomposition is desirable, but might damage the quality of the yarn unless special care is taken. C—1D.

Spinning Jets: Current Practice in Manufacture and Use. J. M. Pirie. *Fibres (Text. Ind.)*, 1951, 12, July, pp. 216-219. The common methods of manufacturing jets for the spinning of synthetic fibres are briefly outlined. The design of the jet, and the metal from which it is made, are indicated for several fibres, including glass fibres. C—1D.

Viscose: Studies on Filtration. V. B. Nicolaysen and Willy Bergh. *Norsk Skogindustri*, 1950, 4, pp. 219-225. In English. (Through *Chem. Abstr.*, 1951, 45, No. 1, p. 346[e]). A review is given of previous theoretical and experimental work published on the filterability of viscose and the determination of the

characteristic clogging constant. The standard German method of determining this clogging constant is said to give incorrect results. A graphical method is given which eliminates the disturbing influence of swelling of the filter medium. Experiments are described which show the effect on the clogging constant of the presence of alkali, viscosity, filtering pressure, and porosity of the filter medium. The data suggest that the clogging is influenced by the undissolved viscose, and by the electrostatic forces of the inner structure of the viscose. **C—1D.**

Viscose Process: Swelling and Floating Tendency of Pulp Sheets during Steeping. II. E. Ringström and N. H. Apler. *Svensk Papperstidn.*, 1950, **53**, pp. 127-132. In English. (Through *Chem. Abstr.*, 1951, **45**, No. 1, p. 346[d]). The authors studied the effects of steeping-liquor properties, such as concentration, temperature, hemicellulose content and surface tension, on the swelling and floating of pulp sheets. The addition of anionic and cationic surface-active agents increased floating tendency. **C—1D.**

Terylene, a Polyester Fiber. Isai Okamura, Jiro Shineha and Keizo Hashimoto. *Bull. Research Inst. Teikoku Jinzo Kenshi Kaisha Ltd.*, 1950, **2**, No. 1, pp. 48-55 (through *Chem. Abstr.*, 1951, **45**, No. 1, p. 388[e]). Terephthalic acid was esterified to its methyl ester and subsequently condensed with varying amounts of ethylene glycol to resins. Spinnable products were obtained from the ester-glycol mixtures (molecular ratio of from 1·5 to 2·0) with *p*-methyl benzene sulphonic acid as the catalyst, and from a 1·3 molecular mixture with sodium ethoxide as the catalyst. The acid chloride of terephthalic acid, similarly condensed, formed resins spinnable to longer fibres. All these fibres were brittle. The molecular weight of the best fibres thus obtained was about 2,500, as estimated from the determination of the terminal radicals. **C—1D.**

Wet Spinning of Acetate Rayon. A. J. Hall. *Text. Merc.*, 1951, **125**, No. 3248, pp. 23, 25, 27. After outlining the processes involved in the manufacture of cellulose acetate rayon, and summing up the advantages and disadvantages of dry spinning, the author gives details of a new patented process for the wet spinning of acetate rayon. **C—1D.**

Acrilan. *Hosiery Ind. Whly*, 6/8/51, **60**, (6), 3. Note on the properties of a new acrylic synthetic fibre named "Acrilan" introduced by Chemstrand Corporation. The fibre is to be produced at the rate of 30,000,000 lb. per year at a plant being built at Decatur, Ala. **H—1D.**

PATENTS

Nylon Solutions: Production. Imperial Chemical Industries Ltd., Rowland Hill, R. G. A. New and S. M. Todd. B.P.645,033: Appl. 13/2/1948; Filing 11/2/1949; Publ. 25/10/1950. The claim is for the use of 5-membered ring compounds of the type of ethylene, propylene and 2-butylene carbonates, or succinic, maleic and phthalic anhydrides, as solvents for nylon. Solution occurs at temperatures in the region of 180 to 220° C., and separation from solution some 10 to 20° lower. C.

Artificial-Bristle Cutting Apparatus. Imperial Chemical Industries Ltd. and Robert Lipscomb. B.P.645,159: Appl. 8/3/1948; Filing 7/3/1949; Publ. 25/10/1950. The invention relates to apparatus for cutting a running continuous filament, so that it presents recurrent tapered portions, convenient for subsequent cutting into artificial bristles. It consists of a small wheel with three cutting teeth; it is rotated at high speed (for example, 10,000 r.p.m.) in the direction of travel of the filament, so that this is "shaved" as it passes in a taut condition under an eccentrically mounted roll. C.

Rayon: Continuous Liquid-Treatment Roller. Courtaulds Ltd., J. H. Givens, John Wale and Leslie Rose. B.P.645,171: Appl. 7/5/1948; Filing 6/5/1949; Publ. 25/10/1950. The continuous treatment of a yarn (especially viscose rayon) with liquids is effected on a roller which is divided into zones that are alternately wettable and non-wettable, so that the liquid supplied to a particular treatment zone does not pass across the surface of the boundary zone. The non-wettable surfaces are formed of bands of polyethylene or polymerised tetrafluoroethylene. C.

Alginate Monofils: Production. Courtaulds Ltd. and E. E. Tallis. B.P.645,243: Appl. 2/7/1948; Filing 1/7/1949; Publ. 25/10/1950. An aqueous solution of sodium alginate (or soluble salts of other polyuronic acids) is extruded into a coagulating bath, which contains a metallic salt that forms an insoluble alginate

(for example, calcium chloride). The monofil is further treated with the salt until the interaction is complete (for example, in a rotating pot); the set monofil is dried (with or without washing) at a temperature not exceeding 40° C. without strain, then wetted to induce swelling (for example, with an aqueous-alcoholic solution that converts the insoluble alginate into a soluble form), and then dried under tension. C.

Light-Resistant Cellulose Ester Textiles and Films: Production. Courtaulds Ltd., W. G. Cameron and L. F. H. Breens. B.P.645,392: Appl. 21/7/1948; Filing 20/7/1949; Publ. 1/11/1950. The resistance of cellulose esters to sunlight and ultra-violet light is increased by the incorporation of an alkyl ester of gallic acid, such as ethyl gallate, tri-acetyl propyl gallate or tribenzoyl propyl gallate. This may be added to the dope from which the cellulose ester filaments or films are spun, or fabric may be padded with an aqueous-alcoholic solution of the agent. C.

Bleached Viscose Rayon Yarn: Continuous Production. Courtaulds Ltd., J. H. Givens and Leslie Rose. B.P.645,969: Appl. 24/5/1948; Filing 23/5/1949; Publ. 15/11/1950. The claim is for the continuous production of bleached viscose yarn, preferably by means of a thread-advancing apparatus. The yarn is treated with a bleach liquor that will have its desired effect without appreciable degradation of the cellulose, and be destroyed by heat during the subsequent drying. Chlorine water and a suspension of calcium hypochlorite are mentioned in the claims, but the examples show good results with solutions of sodium hypochlorite containing from 25 to 350 parts per million of available chlorine. C.

Liquid Treatment of Artificial Continuous Filamentary Materials: Method and Apparatus. American Viscose Corporation, Richard W. Stanley and William B. Lowe. U.S.P.2,551,646: Appl. and filing 29/2/1944; Publ. 8/5/1951. C.

Dry Spinning Apparatus [for Rayon Production]. American Viscose Corporation and Alvin Lodge. U.S.P.2,551,684: Appl. and filing 21/5/1946; Publ. 8/5/1951. C.

Gathering Head Valve for Cotton Harvesters. Grover C. Curtis. U.S.P. 2,551,827: Appl. and filing 18/6/1949; Publ. 8/5/1951. C.

Zein Fibers: Production. Corn Products Refining Co., and William E. C. Yelland. U.S.P.2,552,079: Appl. and filing 21/9/1948; Publ. 8/5/1951. C.

Cellulose Ester Textile [Staple Fibre] Materials: Production. Celanese Corporation of America, Percy Frederick Combe Sowter, and Frank Brentnall Hill. U.S.P.2,552,598; Appl. and filing 9/8/1949, in Great Britain 23/9/1948; Publ. 15/5/1951. C.

Coated Glass Fibers and Method of Making Same. Owens-Corning Fiberglas Corporation, and Robert Steinman. U.S.P.2,552,910: Appl. 16/4/1947; Publ. 15/5/1951. C.

Guiding of Threads or Filaments. Lustrafil Ltd. and Sydney Warren Barker. U.S.P.2,553,127: Appl. and filing 21/2/1947, in Great Britain 23/2/1946; Publ. 15/5/1951. C.

Staple Fiber Spinneret. American Viscose Corporation and Wesley L. Webb. U.S.P.2,553,692: Appl. and filing 3/7/1948; Publ. 22/5/1951. C.

Dehairing of Hides. R. A. Whitmore (to United Shoe Machinery Corporation). U.S.P.2,523,486 of 26/9/1950. An electrolytic dehairing solution is used for wetting the hair. An electrolytic current is then passed through the hide from the flesh side to the hair side. The loosened hair is scraped from the hide without appreciable injury either to hide or hair. W.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A)—Preparatory Processes

Flyer: The Construction of the Press-Finger. E. Baltz. *Textil-Praxis*, 1948, 3, No. 12, pp. 378-379. In German. Consideration of the dynamic factors involved leads to the conclusion that, by suitable choice of weight of the press-finger and the position of its centre of gravity, a considerable degree of independence of the pressure of the finger from diameter of the bobbin can be obtained. C—2A.

Movement of Fibres During Drafting: General Problems Connected with— V. Zotikov. *Rayonne*, 1950, **6**, No. 6, pp. 81-90. In French (translated from the Russian by V. Breslav). The author seeks to establish the laws governing the movement of fibres during drafting, with a view to discovering means whereby yarn irregularity may be eliminated or reduced to a minimum. Distinction is made between controlled and floating fibres, the former having a length at least as great as that between two pairs of drafting rollers. The movement of each of these types of fibre is then examined in detail. The paper concludes with discussions on each of three hypotheses put forward by Zotikov, Brichine and Boudnikov, respectively. (See also *J. Textile Institute*, 1951, **42**, A147.) C—**2A.**

Drafting in the Spinning Process: Some Aspects of the Theory. V. Zotikov (translated from the Russian by V. Breslav). *Rayonne*, 1950, **6**, No. 5, pp. 89, 91-93. In French. The behaviour of the fibres during the drafting stage of the spinning process is examined from a mathematical standpoint. The total drafting is considered to take place in stages which are either equal or unequal, thus bearing a close resemblance to practice. Unevenness, variation in number of fibres at each stage, and the movement of fibres are considered. C—**2A.**

Winding of Roving on Fly-Frames. A. Blumcke. *Textil-Praxis*, 1948, 3, No. 12, pp. 377-378. In German. A theoretical consideration is undertaken of the relation between (1) yarn tension between the drafting section and the spindle, and (2) the tightness of yarn on bobbin. C—**2A.**

Synchronous Drives for Carding Sets. Anon. *Text. Rec.*, 1951, **69**, No. 821, p. 106. Brief details are given of a system achieving perfect synchronisation of parts of 2- or 3-part carding sets by electrical means. W—**2A.**

Tape Condensers: Width of Tape. ("Die Teilung des Florteilers.") R. Schumann. *Text.-Praxis*, 1951, **6**, 476-477. Dependence on slubbing counts of optimum tape widths and web weights for an average material is studied. Relations between tape surface (or reciprocal of web weight) and slubbing count for optimum tape width and for maximum and minimum tape widths are given, and these are converted into equations involving tape width and slubbing count. Examples of the use of the equations follow. W—**2A.**

Carding: Removing the Web from the Doffer. ("Le détachage du voile de peigneur a la carde.") J. Chardel. *Industrie Text.*, 1951, **67**, 317-318. A method is described for improving the removal of the web from the doffer of a card by the use of a compressed air jet, either alone, or preferably in combination with the oscillating comb. Mechanical details of the jet are given. W—**2A.**

Woollen Carding: Blending Room Equipment. Platt Bros (Sales) Ltd. *Platt's Bull.*, 1951, **7**, 183-187. Details are given of the construction and advantages of the Platt cockspur teazer and single and double cylinder hard-waste openers. W—**2A.**

Tape Condensers: Operation and Maintenance. W. J. Crofts. *Text. Industr.*, 1951, **115**, No. 7, 82-84 and No. 8, 95-97. The author considers first the drafting of the web and ways of attaining the correct tension applicable to the fibre used. The setting of the dividing rollers and the selection of the correct number and width of tapes for a given card width are discussed. Part 2 deals with adjusting leather and rubber rubbing aprons for different grades of wool and for rayon-wool blends and mentions a method for continuously oiling them and preventing damage by broken ends. It is suggested that aprons should be installed in pairs and that tape tensions should often be checked. W—**2A.**

(B)—Spinning and Doubling

Crompton Way. T. Thompson. London: Allen and Unwin, 1947, 224 pages. The story of Samuel Crompton, inventor of the spinning mule, is here told in fictional form. C—**2B.**

Drafting in the Ring Frames. M. Srivastava. *Indian Text. J.*, 1951, **61**, No. 726, March, pp. 416-420. Different types of drafting systems in spinning frames are described, including the following: the three-roller drafting system, the bottom middle roller out of alignment, the Latsch drafting system, the bridge drafting system, the Gibello system, the four-roller system, the Le Blan Roth system, the Vanni system, the single-apron drafting system, and the double apron (Casablancas) system. It is suggested that the Casablancas double-apron

system is the best as it deals more satisfactorily with greater variation of fibre length. Some usual drafts recommended for different cottons are given for the four-roller system, the single-apron system and the double-apron system. C—2B.

The Ring Frame. N. Hooper. *Text. Wkly*, 1951, 47, No. 1210, pp. 1406, 1408, 1410, 1413, 1414. In this survey of modern developments in the design of ring frames the author deals in turn with the spindle and bobbin formation, drafting, and individual electric drives. C—2B.

Spinning Regulator, Thread-Breakage, and Tension. H. Wildhaber. *Textil-Rdsch.*, 1950, 5, No. 11, pp. 464-466. In German. In discussing the Brown-Boveri "classical" system of spinning control, in which the basic speed of the spindle is altered and supplementary periodic speed changes are made to allow for changes in balloon size, the author points out the advantages of retaining the supplementary change system in variable speed spinning. C—2B.

Worsted Spinning: Frequency of Thread Breakage and Spinning Limit. ("Über die Fadenbruchzahl und Spinngrenze in der Kammgarnspinnerei.") W. H. Schneider. *Textil-Rdsch.*, 1951, 6, 356-366. The influence of the number of fibres in the cross section of a yarn on its irregularity is discussed, and a method is given for calculating the frequency of thread breakage. W—2B.

Ring Spinning Machine for Woollens. ("Neuartige Streichgarnringspinnmaschine.) F. Hadwich. *Textil Praxis*, 1951, 6, 393-396. The operation of the patented "twisting and delivery device" made by the Bremer Spinnereimaschinenbau-Gesellschaft is explained. This device, it is claimed, prevents the sliver from being subjected to irregular and uncontrollable stretching as it is over the short untwisted length when a twisting tube is used. This is achieved by spreading the temporary twist over the whole distance between the front and back rollers and incorporating it immediately in the final twist. The advantages claimed for this system are higher draft, more even yarn and higher spinning speeds. W—2B.

Mule: Production. ("Leistungen des Selfaktors.") K. Rautenstengel. *Text.-Praxis*, 1951, 6, 470-471. Tables are given to show that the carriage motion is faster for finer yarns despite the increased twist, owing mainly to the use of better quality material, and that, to maintain high over-all efficiency, end breakage should be avoided even by slowing the motion. Efficiency is stated to increase with fineness of yarn and size of cop (making maximum use of length of spindle and gauge), and to be optimum for a mule of 420 spindles. Staffing is also discussed. W—2B.

Spinning: Some Aspects of the Early History with Special Reference to Wool. H. Lemon. *J. Textile Institute*, 1951, 42, P479-P501. A review of the development of spinning methods, from the earliest times to the introduction of machinery. Carding and combing methods, and the effect of these on spinning, are also discussed. W—2B.

Continental Drawing: Mixing of Coloured Fibres. P. P. Townend. *Text. J. Austral.*, 1951, 26, 307-310. With a view to reducing the number of drawing operations, investigations were made to examine the effect of doublings, drafts and number of operations on the perfection of the mixing of wool fibres using the continental system of drawing and spinning. The results are given. W—2B.

End Breakage in Drawing. Anon. *Wool Rec.*, 1951, 80, 905-910. The causes and prevention of the production of a "single" (*i.e.* a sliver or slubbing with fewer doublings than are required of a particular machine) in worsted drawing are reviewed. A device made by Electrical Products (Colne) Ltd., to detect such a "single" and to stop the machine when it occurs is described and the advantages resulting from its installation are enumerated. W—2B.

Worsted Spring-weighting System Gives Better Fibre Control. Anon. *Text. World*, 1951, 101, 7, p. 143. A new patented drafting assembly for worsted spinning frames is announced. This high-draft device has five rollers and a leather apron. An adjustable pressure on the feed roll permits the processing of twisted or untwisted slivers from any drawing system such as French, American, Anglo-Continental or Bradford. W—2B.

Woollen Mule: Jacking Up. Anon. *Text. Merc.*, 1951, 125, 541, 543, 545. The necessity of jacking up in woollen spinning and the conditions affecting the take-up factor are briefly explained. The requirements of the motion are

enumerated and a description of how these are met is given with the aid of diagrams. W—**2B.**

Fibre Breakage in Worsted Yarn Manufacture. Anon. *Fibres*, 1951, 12, 291-292. The occurrence of fibre breakage at various stages in worsted yarn manufacture is briefly reviewed. W—**2B.**

(C)—Subsequent Processes

Twist-Setting: Use of Vacuum Steaming Equipment. Anon. *Wool Rec.*, 1951, 80, 802, 804. Steam treatment of yarns which have a tendency to twist up is discussed and the process of low-temperature vacuum steaming explained. A patented process is claimed to give a yarn evenly elongated throughout the package and to give level dyeing properties. W—**2C.**

Patents

Two-Zone Apron-Type Drafting Mechanism. Claude Delesalle. B.P.645,066: Appl. and filing 3/11/1947; Publ. 25/10/1950; French appl. 9/10/1946. The claim is for a two-zone drafting system for drawframes, flyer frames, ring frames, and mules, in which the fluted feed and intermediate rollers are arranged close together, the pressure feed roller being considerably displaced towards the rear; thus, in the back drafting operation, each sliver or roving is not only firmly gripped by the feed rollers, but is also held in contact with and supported by the fluted feed roller over a substantial part of its circumference. The adjustable aprons fitted on the intermediate rollers control the fibres subjected to the front drafting operation. C.

Spinning-Frame Drafting Head Suction-Cleaning Device. H. C. Bechtler. B.P.645,432: Appl. and filing 28/1/1948; Publ. 1/11/1950; Swiss appl. 5/2/1947. A spinning frame is fitted with suction nozzles, for the removal of dust and fluff from the drafting heads and the collection of broken ends, the nozzles being at the ends of tubes that are connected by rubber tubing to a main collector pipe. It is thus possible to displace the nozzles from their normal position far enough for the operative to piece up broken ends without stopping the frame. The device is particularly suitable when long-staple materials, such as worsted and schappe silk, are being spun. C.

Acrylic-Nitrile/Butadiene Co-polymer Drafting-Roller Cots. Dayton Rubber Co. B.P.645,475: Appl. and filing 3/12/1946; Publ. 1/11/1950. The claim is for a drafting roller covering material that is resistant to lapping and "eyebrowing". It comprises a vulcanised acrylic-nitrile/butadiene copolymer in which is uniformly dispersed finely ground rubber or shredded cellulose sponge differing in hardness from the resilient body. By grinding the surface of the cot, the exposed harder particles drop out and leave a microscopically pitted or pock-marked surface that in drafting grips the textile fibres efficiently. By varying the vulcanisation and the content of the incorporated hard particles, covering materials for other textile rollers (for example, loom temples) may be obtained. The body material is free from sand or common salt. C.

Lubrication of Textile Fibres. Textile Oils Ltd., C. W. A. Mundy and R. H. H. Morley. B.P.650,759 of 7/3/1951. The action of soap or other detergents in removing oils from wool fibres is enhanced by adding various assistants to mineral oils or mineral oil blends. The assistants consist of a blend of esters prepared by reacting a triglyceride fatty oil with a polyhydric aliphatic alcohol or mixture of such alcohols. Preferably additions are made of 5–10 per cent. of the ester blends by weight of the whole composition. W.

Fibres: Method of Electrically Treating to Decrease their Elasticity and Increase their Tensile Strength. S. Blumenthal & Co. Inc. B.P.652,762 of 2/5/1951. Rovings or similar unspun fibres, particularly animal fibres, are subjected to the action of a high frequency electric field. Spools or rovings may be treated either while stationary or on a travelling belt. The elasticity (inherent springiness) is reduced, the tensile strength increased 25-30 per cent., and the elongation characteristics improved. The treatment takes approximately 15 minutes, and eliminates the need for ageing. W.

Textile Fibre Drafting Rollers. E. J. Courtney. B.P.654,647 of 27/6/1951. Rollers, preferably for use in worsted drafting, have clamping discs which engage the roller cover and frictionally retain it in position. The cover has an incompressible inner layer of fibre bonded with synthetic resin, *e.g.*, phenol-formalde-

hyde, and a compressible facing layer bonded to the inner layer. It is claimed that a true cylindrical surface is maintained throughout the service life of the cover. W.

Rabbit Hair: Treatment. H. C. E. Tillisch (to I/S Anitil). U.S.P.2,547,060 of 3/4/1951. Rabbit hair, either in the natural state or curled, is treated with a fluid rich in volatile aldehydic substance of the class consisting of lower aldehydes and lower aldehyde-acids, at *pH* 1-7 and at a temperature between room temperature and 100° C., followed by neutralisation with ammonia. The treatment, by permanently altering the surface qualities of the hairs, reduces their frictional electricity, and thus facilitates carding and spinning, and reduces fluffing in wear. Apparatus for curling the hairs is also claimed, the curling becoming fixed by the chemical treatment. W.

Spinning and Twister Ring. Ralph V. Blackwood. U.S.P.2,550,761: Appl. and filing 21/4/1950; Publ. 1/5/1951. C.

Yarn Twister or Plier. Alexander Smith & Sons Carpet Co. and Herbert J. Potts. U.S.P.2,551,462: Appl. and filing 10/9/1949; Publ. 1/5/1951. C.

Twisting Mechanism [for Chenille-Making Machine]. Clair B. Weller. U.S.P. 2,551,986: Appl. and filing 3/7/1950; Publ. 8/5/1951. C.

Ply Yarn: Method of Making [on the Spinning Frame]. Walter B. Parker. U.S.P.2,552,210: Appl. and filing 29/1/1948; Publ. 8/5/1951. C.

Weft Detector for Looms. George C. Moore Co., and Samuel F. Siciliano. U.S.P.2,552,498: Appl. and filing 17/3/1950; Publ. 8/5/1951. C.

Stop Motion for Carding Engines. Thomas L. Hand. U.S.P.2,554,104: Appl. and filing 10/4/1948; Publ. 22/5/1951. C.

Bobbins in Creels: Means for Suspending. Howard and Bullough Ltd. and John Kenneford. U.S.P.2,554,148: Appl. and filing 1/12/1949, in Great Britain 3/2/1949; Publ. 22/5/1951. C.

3—CONVERSION OF YARNS INTO FABRICS

(A)—Preparatory Processes

Rayon Winding, by Spinner or Weaver? H. Lagache. *Rayonne*, 1950, 6, No. 5, pp. 85, 87. In French. In assessing the respective merits of winding rayon either in the spinner's or in the weaver's establishments, the conclusion is drawn that the latter offers the greater advantage. Change of atmosphere has considerable effect, the weaver has a better appreciation of the particular type of spool required, and so on. C—3A.

Spooling of High-Twist Crêpe Yarns from Cones. A. Perichard. *Rayonne*, 1950, 6, No. 5, pp. 63-65. In French. C—3A.

Warp-Beam with Removable Flanges. R. Becker. *Rayonne*, 1950, 6, No. 5, pp. 165, 167. In French. The author describes the construction of a light-alloy warp beam having removable flanges which can be securely locked and which are resistant to shock-disturbance. C—3A.

Knot-tying Machine Speeds Worsted Warp Preparation. E. H. Helliwell. *Text. World*, 1951, 101, No. 7, p. 131. A method is described of warp preparation prior to warp tying by the Titan machine. W—3A.

(B)—Sizing

Silk Soaking Bath: Exhaustion. F. Bryant. *Text. Res. J.*, 1951, 21, No. 3, pp. 164-165. Tests were made on the effect of adding sulphated cetyl alcohol and sodium sulphate to a silk-soaking bath. To get a 90 per cent. exhaustion, both had to be added in the exact proportions of 0·003 per cent. sulphated cetyl alcohol and 0·08 per cent. sodium sulphate. This same exhaustion could be obtained without the addition of the alcohol and sodium sulphate, and no purpose seems to be gained by adding them to the bath. C—3B.

(C)—Weaving

Loom-Stoppage Control: The Grobel "Électrographe-Centralisateur". Société d'Appareils de Précision de Paris. *Rayonne*, 1950, 6, No. 5, pp. 99, 101, 103-105. In French. A description is given of the principle and operation of the "électrographe centralisateur" based on the Grobel system. This device permits of a continuous control, both individually and collectively, of any number of looms

up to sixty-two. Stoppages are recorded whatever their cause, duration, or frequency. In addition to a permanent paper record, lights indicate stoppages as they occur. The interpretation of results is discussed. C—3C.

Loom Reeds: Selection. A. Perichard. *Rayonne*, 1950, 6, No. 6, pp. 35-37. In French. Loom reeds require to be made with a high degree of precision, but must also be able to stand up to a considerable amount of work. The construction of soldered reeds is described, and their selection according to the work to be done is discussed. C—3C.

Loom-Sley Mechanisms: Kinematic and Dynamic Investigations. W. Lichtenheldt. *Faserforsch. u. Textiltech.*, 1951, 2, No. 3, pp. 89-104; No. 4, pp. 141-153. In German. The author aims at giving an exhaustive account of the design of loom-sley drive mechanisms. The historical development of this mechanism during the past hundred and fifty years is described with the help of numerous diagrams. After showing that the haphazard empirical methods of design have been unable to cope fully with practical requirements, the author discusses in great detail the dynamic and kinematic aspects of sley mechanisms, and shows how it is possible not only to design a completely satisfactory movement on the drawing-board, but also to be able to forecast with accuracy its mechanical behaviour and practicability. There are fifteen references. C—3C.

Loom Efficiency Evaluation. W. Ruggli. *Textil-Rdsch.*, 1950, 5, No. 12, pp. 515-517. In German. The author describes a simple method for evaluating loom efficiency by means of a marked slide rule. The method also permits the rapid assessment of the potential output of a loom for a given number of picks per inch. C—3C.

Double-Piece, Double-Shuttle Moquettes: Manufacture. J. Cowburn. *Text. Mfr*, 1951, 77, March, pp. 112-114. This article deals with the production of double-piece fabrics using two lots of warp yarn and two shuttles. The two component pieces are held together by a pile yarn, which is subsequently cut to give two separate pile fabrics. C—3C.

Multi-Loom Operation Problems. Josef Cornely. *Faserforsch. u. Textiltech.*, 1951, 2, No. 4, pp. 154-167; No. 5, pp. 195-202. In German. The paper describes in detail an investigation into the factors involved in the operation of several looms by one person. An exhaustive analysis of the work involved in tending the machines, and of the aptitude and skill of the operator, was essential for achieving the object of the investigation, namely, the principal causes of drop in production efficiency. In the case of the operator it is usually found that little attention need be devoted to time and motion study of the individual operations involved, but more rhythmic working in passing from one operation to another should be sought, in order to cut down the "dead time". In the case of the machines, the principal cause of efficiency loss can be traced to warp and weft breakages. Data relating to personnel and loom efficiencies are given, together with formulæ for calculating various fundamental efficiency relationships. C—3C.

Faulty Warps: Processing. G. Hummel. *Textil-Praxis*, 1948, 3, No. 12, p. 383. In German. The article discusses means of overcoming faults caused in processing (sizing, *etc.*), and avoiding mechanical damage (such as that due to transport, *etc.*). C—3C.

Weaving: Productivity. R. Watson. *Text. Wkly*, 1951, 47, *No.* 1208, pp. 1284, 1286, 1288; No. 1209, pp. 1354, 1356, 1358. This is a report of a lecture given by the chairman of the Weaving Productivity Team on his impressions of the American weaving industry. Particular attention is paid to the problem of implementing in Lancashire the findings of the report of the Weaving Productivity Team. C—3C.

Steel-Wire Healds: German Standard. German Standards Committee, Textile Section. *Textil-Praxis*, 1948, 3, No. 12, pp. 375-376. In German. Details are given of German Standard DIN 64603 in which proposals are made for standard structures and sizes of steel-wire healds. C—3C.

Selvedge Motion. Sidgwick Silks Ltd. *Text. Merc.*, 1951, 125, No. 3250, p. 118. C—3C.

Warp Yarn Strain. John H. Strong. *Text. Merc.*, 1951, 125, No. 3248, pp. 17, 20. The various factors that affect warp yarn tension during weaving are indicated, and some hints are given on loom setting to keep strain of the warp yarn down to a minimum. C—3C.

Wilton Carpets: Construction on the Double-piece Double-shuttle Principle. J. Cowburn. *Text. Mfr.*, 1951, 77, 272-274, 340-342. Making particulars are given for plain and figured Wilton carpets. A modification of the Wilton weave is described, which allows the production of carpets with the same face appearance as those having the same number of pile yarn frames or colours. W—3C.

Jacquard. J. W. Hutchinson. *Text. Merc.*, 1951, 125, 451-2. Details are given of a new jacquard by J. T. Hardaker, of Bradford. A new feature is that for every alternate pick, three sheds are made, one for the ground weave and the other two for figuring. The cotton ground threads come from an ordinary warping beam whilst the worsted yarn is used direct from a large warping creel. The weft, of one colour and wound on 8-inch bobbins, is woven from a single shuttle. W—3C.

(D)—KNITTING

Skinner's Hosiery and Knit Goods Directory, 1951. Anon. Manchester, Thomas Skinner, xx+500 pages. The fourth issue of this directory lists trade associations, textile societies, textile colleges, trade holidays, hosiery manufacturers, yarn spinners, elastic yarn manufacturers, dyers and finishers, smallwares manufacturers, manufactures, merchants, directors, trade marks, and mill supplies. C—3D.

Knitting: Fully-fashioned: Tension Device. *Hosiery Ind. Whly*, 27/8/51, 60, (9), 3. Note on a new tension device introduced by Hosiery Mill Accessories Co., Northampton, Mass., which is said to eliminate selvedge loops, provide perfect yarn control and reduce stress on carrier tubes, needles and sinkers. The device is designed, primarily, for use on fully-fashioned machines. Illustrations. H—3D.

(G)—FABRICS

Allgemeine Webwarenkunde. Hans Hünlich. Berlin: Schiele & Schön, 1951, 128 pages. In German. This book deals generally with the design and construction of woven fabrics and includes twenty-four pattern cards, each with four samples. C—3G.

Bindungstechnik gewebter Stoffe. I. Dr. Schams. Leipzig: Voigt Verlag, [? 1951], 102 pages. In German. The first part of this book on the design and construction of woven fabrics deals with simple weaves. It includes four hundred and eighty-three point-paper diagrams. C—3G.

Tubular and Rubber Elastic Tape: Structure and Manufacture. A. Heidemann. *Textil-Praxis*, 1948, 3, No. 12, pp. 384-385. In German. C—3G.

Elementary Textile Design and Fabric Structure. John Read. Manchester: Textile Institute, 1950, 111 pages. This is a revised and enlarged edition of a book originally published in 1931. It deals with the fundamental weaves requiring one warp and one weft. The different chapters are concerned with the principles of weaving and the use of design paper; plain, twill, satin, and diamond and spot weaves; designs made by reversing (mock leno, huckaback, crêpe); elongated twills (gaberdine, whipcord); poplin and repp fabrics; and effects controlled by yarn features. The book is extensively illustrated. C—3G.

Summary of Specification Requirements for Quartermaster Textiles. Edwin B. Armstrong. *U.S. Quartermaster General Textile Series Report*, No. 67, 1951, 60 pages. This report gives details in tabular form of: various fabrics made from cotton (plain, twill, duck, special, napped, pile, and knitted fabrics), wool (plain, twill, special, napped, and knitted fabrics), rayon, nylon, mixed fibre, jute, and silk; narrow (braided fabrics, tapes, and webbings) and coated fabrics; finishing and after-treating specifications; and test methods. C—3G.

Tapestry Fabrics in Cotton. John H. Strong. *Text. Merc.*, 1951, 125, No. 3249, pp. 63-64. Details are given of the construction of a few cotton tapestry fabrics. C—3G.

Fillings and Stuffings for Bedding, Upholstery, Toys and other Domestic Articles: Cleanliness. Brit. Standard 1425: 1951, 30 pp. Revision of *Brit.*

Standard 1425: 1948. Separate specifications are given for each type of filling; the specification for woollen flock mixture has been temporarily suspended, and a new specification is included for wool filling composed entirely of sheep's virgin wool. The appendices give methods for determining cleanliness, oil and soap, animal fibre content, trash, chlorine as soluble chlorides, and dust. The sampling procedure has been simplified, and extended to cover layered and made-up materials, and to include production over a period of time. Each specification requires the use of the registered certification mark of the British Standards Institution as evidence of compliance with the specification requirements. W—3G.

Felt: British Standard Specification for Woollen Felt and Woollen Mixture Felt for Bedding, Upholstery and Similar Purposes. *Brit. Standard* 1762: 1951, 8 pp. The material shall comply with the cleanliness requirements specified in Brit. Standard 1425 (see preceding abstract). Woollen felt shall contain not less than 85 per cent., and woollen mixture felt not less than 60 per cent., animal fibre content. Appendices give methods for determining animal fibre content, and for sampling. W—3G.

Materials for Fire Brigade Uniforms. British Standards Institution. British Standard Specification 1771: 1951. This standard covers woollen cloths, serges, and worsteds. Manufacturing particulars are given, and finished cloth requirements are stated. Appendices give methods of test to determine width, weight, number of threads per inch, breaking load, relaxation shrinkage, and colour fastness to light and washing. W—3G.

PATENTS

Warp-Knitting Machine Warp-Guide. American Viscose Corporation. B.P. 645,016: Appl. and filing 10/9/1947; Publ. 25/10/1950; U.S.A. appl. 19/9/1946. A warp guide, comprising a number of aligned tangs projecting outwards from the plane of the guide, is fitted with a U-shaped guard carried on the outer ends of the tangs, to prevent escape of the yarns passing between the tangs. Friction on the yarn is thus reduced, since it is not deflected in an S-curve as with the usual type of guide. C.

Circular-Knitting Machine Elastic Yarn Feeding Device. Hemphill Co. B.P. 645,060: Appl. and filing 18/7/1947; Publ. 25/10/1950; U.S.A. appl. 25/6/1940. The claim is particularly for a device for feeding elastic yarn to latch needles of a circular, independent-needle knitting machine. It comprises a finger having an opening through which yarn is threaded and from which it emerges to be taken in needle hooks; a projection adjacent to the opening has bevelled surfaces for guiding the yarn close to the passing needles, but is so formed as to project under the needle hooks and beneath their path. C.

Cellulose Ester or Cellulose Ether Staple-Fibre Sweat Bands for Hats. British Celanese Ltd. B.P.645,112: Appl. and filing 4/8/1948; Publ. 25/10/1950; U.S.A. appl. 7/8/1947. A sweat band for hats comprises a cushion of interlaced staple fibre, mostly of cellulose acetate or related materials, coated with a skin of coalesced fibre, and enclosed in an envelope of textile fabric. C.

Circular-Knitting Machine Widening and Narrowing Pick. Hemphill Co. B.P.645,460: Appl. and filing 1/6/1948; Publ. 1/11/1950; U.S.A. appl. 10/6/1947. The invention relates to a pick, for a circular independent-needle knitting machine, that ensures correct operation on the needle butts in widening or narrowing. The pick has a recess in which is an adjustable abutment, for limiting the number of butts that may be received in the recess at one time, and/or excluding long butts. C.

Loom Let-Off Motion Drag-Equalising Device. Herbert Gardner. B.P.645,471: Appl. 15/11/1944; Filing 15/12/1945; Publ. 1/11/1950. The invention relates to a let-off motion in which equal friction or drag is applied at the two ends of the warp beam, by means of a spring acting on the friction ropes or chains through a compensating member. The spring may be finely adjusted during working by means of a screw-threaded rod, and quickly released when required. Alternative methods of applying tension to the warp are given in detail. C.

Straight-Bar Knitting Machine with Rigid-Hook Needles. Dexdale Hosiery Mills. B.P.645,486: Appl. and filing 7/8/1947; Publ. 1/11/1950; U.S.A. appl. 19/8/1942. The invention is aimed at reducing needle breakage on fine-gauge machines of the Cotton type. The usual spring beard needles are replaced by

needles with plain short rigid hooks, and separately actuated co-operative beard points that function as needle beards and also control the yarn to ensure that it is taken by the end needles for selvedge formation. During stitch formation the beard points referred to are interposed between the needles and the presser ledge, and are buttressed by the ledge as the needles are lightly pressed against them. Means are provided to reduce to a minimum the period of sliding contact of the points with the ledge during each stitch-forming cycle. The beard points are actuated from above the needles, and are retracted automatically during fashioning, when the usual loop transfer points come into operation. The needle beard points can also be moved out of the way when access to the needles is desired, as for welt turning. Details are shown in seven sheets of machine drawings. C.

Wide Loom Reed-Cap Support. Thomas Hindle. B.P.645,578: Appl. 7/10/1948: Filing 30/9/1949; Publ. 1/11/1950. The claim is for means of supporting the reed cap at intermediate points along its length in a wide loom in which the sley is carried on three or more swords; the bottom baulk of the reed is secured to the sley, and the top baulk is supported by a reed cap. A vertical lever is pivoted on each intermediate sword behind the sley: the upper arm of the lever projects upwards through the warp and carries the reed cap; the lower end of the lever extends into a vertical recess in the sword, and is engaged by screws for adjusting the alignment of the reed cap and reed, and for locking the parts after adjustment. C.

Loom Picking-Cam. Thomas Hindle. B.P.645,579: Appl. 7/10/1948; Filing 30/9/1949; Publ. 1/11/1950. To ensure that the sector tooth of a pawl-controlled picking mechanism is moved up quietly into contact with the pawl before the picking impulse is initiated, the profile of the picking cam or tappet is provided with a "move-up" period equivalent to 10-15 degrees for a cam moving at crankshaft speed. The profile is such that during the "move-up" period the bowl is displaced with simple harmonic motion. C.

Wide Loom Picking-Motion. Thomas Hindle. B.P.645,580: Appl. 7/10/1948; Filing 30/9/1949; Publ. 1/11/1950. The linkage that transmits the picking rocking movement from one sector to the other, on a wide loom in which picking is effected by a single cam and bowl mechanism operating at crankshaft speed, comprises two links—a long continuous link pivoted at one end to the cam-operated sector below its pivot point, and a short reversing link pivoted at one end to the opposite end of the long link, and at the other end to the second sector above its pivot point. The long link is supported by a series of suspension levers, the end one of which, remote from the cam-operated sector, also forms the connection between the two links. C.

Hosiery-Seaming Machine Auxiliary-Feeding Device. Singer Manufacturing Co. B.P.645,786: Appl. and filing 30/9/1948; Publ. 8/11/1950; U.S.A. appl. 8/11/1950. The invention relates to a sewing machine for seaming women's hosiery at high speed, and combines reciprocatory needle and opposed feed-up stitching mechanism, with pull-feed mechanism having driven members for engagement with opposite sides of the work at the level of the needle on the discharge side of the feed cups. Details are shown in six sheets of machine drawings. C.

Circular Knitting Machine Latch-Opener. B. Toone (Nottingham) Ltd. and T. L. Allen. B.P.645,892: Appl. 10/2/1948; Filing 28/3/1949; Publ. 8/11/1950. Disadvantages of common types of latch openers for controlling the needle latches on circular knitting machines are discussed, and claims are made for an opener that has means for positively limiting the movement of its latch-engaging point in a direction towards the needle cylinder. C.

Circular Loom Weft-Detector and Stop-Motion. Société d'Etudes et Recherches Mécaniques (S.E.R.M.). B.P.645,963: Appl. and filing 24/3/1948; Publ. 15/11/1950; French appl. 18/4/1947. The invention relates to a device for detecting the presence or absence of trailing weft in the zone between the shuttle and the beat-up in certain types of circular looms. It consists of a wheel with thin and deep teeth, that rotates on an axis and at the same time accompanies the shuttle. The tips of the teeth bear against the weft, and if this is missing the warp threads enter to a greater depth between the teeth. A "sensing" member,

including a rocking finger, is displaced by the consequent relation motion of the warp, and actuates a relay and then an electric switching device to stop the loom. C.

Pile Fabrics. The Wilton Royal Carpet Factory Ltd. and S. H. R. Clarke. B.P.653,067 of 9/5/1951. Patterns in relief pile fabrics are produced by holding stationary a fabric with uniform pile height, and clipping away those parts of the pile which are to be in lower relief. The clipping may be of varying depth, and may have a continuously curved or a wavy profile. A templet for use as a marking device is described. W.

Laminated Felt. A. Kemp and Underfelts Ltd. B.P.653,461 of 16/5/1951. A backing of hessian or similar open-weave material is attached, *e.g.* by needling, to one surface of each of two or more layers of felt. The non-backed surfaces of the felt are coated with a rubber latex-adhesive composition, and the coated surfaces caused to adhere together by pressure. The backing is then removed, and may be used again for the same purpose. The felt has increased strength and resists stretching. W.

Spool Tension for Axminister Tube Frames. W. Y. Robb (to Crompton & Knowles Loom Works). U.S.P.2,547,491 of 3/4/1951. Improved means are provided for controlling the rotation of yarn spools on Axminster tube frames. Each tube frame has a relatively strong brake or friction device, which is moved to a non-braking position by at least one of the clutches when the tube frame is removed from the chains. W.

Weft Needle Mechanism for Axminister Looms. N. Fletcher and W. Y. Robb (to Crompton & Knowles Loom Works). U.S.P.2,548,662-3 of 10/4/1951. A flexible needle made of concave sheet metal is provided with spaced slots to receive the teeth of a driving sprocket wheel by which the needle is moved into and out of the shed. The long needle rails heretofore used in wide Axminster looms are not required. U.S.P.2,548,662 relates more particularly to the needle driving mechanism, and U.S.P.2,548,663 to the needle itself. W.

Pile Fabrics: Manufacture. M. A. Goldman (to Textron Inc.). U.S.P.2,550,686 of 1/5/1951. A carded layer (or layers) of loosely-matted fibres is impregnated with an agglutinant and subsequently printed with dots of a thermoplastic resin. The looped pile is formed of a separate layer of loosely-matted fibres which is anchored to the dots by means of heat and pressure. The porosity and weight of the finished product can be accurately controlled. The product is suited to the production of powder puffs and the like. W.

Take-Up Let-Back Mechanism for Looms. Erston Young Sprouse. U.S.P. 2,551,910: Appl. and filing 31/3/1949; Publ. 8/5/1951. C.

Tension Apparatus for Loom Warp Yarns [to Prevent Starting Places in Cloth]. Thomas J. Willis and William A. Smith. U.S.P.2,551,920: Appl. and filing 18/7/1949; Publ. 8/5/1951. C.

Shuttleless Loom. Arthur Stanley Colquhoun Hart. U.S.P.2,552,317: Appl. and filing 8/9/1948, in Great Britain 19/9/1947; Publ. 8/5/1951. C.

Shedding Mechanism for Looms. Osborne Firing and Leonard M. Dorman. U.S.P.2,552,418: Appl. and filing 22/12/1949; Publ. 8/5/1951. C.

Winding Machine. Abbott Worsted Mills and Winthrop L. Perry. U.S.P. 2,552,581: Appl. and filing 7/12/1949; Publ. 15/5/1951. C.

Method and Apparatus for Producing Twisted Yarn-like Structures [by Splitting Warp-Knitted Fabric]. American Viscose Corporation, Thomas H. Johnson, and Wirt L. Thompson, Jr. U.S.P.2,552,680: Appl. and filing 30/11/1948; Publ. 15/5/1951. C.

Shuttle Drive for Looms. New York Wire Cloth Co., and Daniel E. Houghton. U.S.P.2,552,418: Appl. and filing 15/3/1950; Publ. 15/5/1951. C.

Means for Producing Carpet-Like Fabric. Bernard Sterner. U.S.P.2,553,017: Appl. and filing 20/2/1948, in Great Britain 17/8/1945; Publ. 15/5/1951. C.

Weft Tension Control for Loom Shuttles. Crompton and Knowles Loom Works, and Richard G. Turner. U.S.P.2,553,221: Appl. and filing 20/10/1949; Publ. 15/5/1951. C.

Pile Fabrics: Method of Making. J. Crawford (to Mohawk Carpet Mills, Inc.). U.S.P.2,553,303 of 15/5/1951. The pile elements are arranged in transverse

rows. Each row includes a full complement of pile elements in the form of both tufts and loops, or of loops of two different heights. The pile warps are maintrained under slack tension, and the remaining yarns under relatively heavy tension. The weft yarn engages all the pile warps and pushes the warps ahead of it to form relatively low loops. When the weft yarn is fully beaten up, the reed engages the previously-inserted wire, and causes it to stand erect, so that the pile warps raised over the wire tighten up to form loops of the height of the wire and the low loops formed by the action of the weft yarn on all the rest of the pile warps remain in position ahead of the yarn as low loops. When the wire is withdrawn, the loops of the pile warps raised over it are either severed to form tufts or remain as high loops, and the low loops of all the other pile warps shift slightly forward. W.

Safety Stop Mechanism for Warp Drawing-in Machines. R. P. Drake (to Barber-Colman Co.). U.S.P.2,553,851 of 22/5/1951. Pairs of release key shafts and turning worm shafts are connected by gearing for operation selectively under the control of a pattern sheet. The latter passes over a perforated drum and has horizontal rows of holes, which are positioned to register with holes in the drum. There is one hole in the drum for each of a horizontal series of control or feeler elements. W.

Yarn Controlling and Tensioning Mechanism [for Rotary Knitting Machines]. James Paul Wilson. U.S.P.2,554,286: Appl. and filing 7/9/1948; Publ. 22/5/1951. C.

4—CHEMICAL AND FINISHING PROCESSES

(A)—Preparatory Processes

Malt Enzymes in Textile Desizing. Muntona Ltd. and Edward Fison Ltd. *Monographs on Malt and Malt Products*, 1951, 14 pages. After a description of the object of warp sizing, and of methods of removing size, this pamphlet gives short details on desizing with malt enzymes. C—4A.

Winding For Package Dyeing. Foster Machine Company. *Text. Merc.*, 1951, 125, No. 3248, pp. 18-19. Brief details are given of two new attachments for Foster winding machines, designed to assist in the winding of all types of yarn for package dyeing. The first is a traverse mechanism which produces a soft-wound package, and the second is a ball-bearing balloon spring holder for large metal dye tubes. C—4A.

(B)—Boiling, Scouring, Degumming and Washing

Wool Shrinkage may Vary for Same Wool. *Natl. Wool Grower*, 1951, 41, No. 4, 24-25. Figures for 120 lots of wool scoured for the Livestock Branch, Production and Marketing Administration of the U.S. Department of Agriculture during 1946, 1947 and 1948, show wide variations in the percentage of non-wool items left in scoured wool. American practice allows 14 per cent. for non-wool components (12 per cent. for moisture and 2 per cent. for grease and ash). Figures show a hypothetical case of shrinkage differences on a lot of 100 lb. of grease wool with the same pure wool content. These variations should be borne in mind by wool producers in comparing scouring plant results with shrinkages previously determined by core testing. W—4B.

Wool Grease: Recovery and Uses and the Regeneration of Scouring Liquors. ("Gewinnung von Wollfett und dessen Verwendung. Aufarbeitung von Waschlaugen.") G. Gernet. *Textil-Praxis*, 1951, 6, 434-438. A review is given of patented chemical and mechanical methods of obtaining wool grease from the scouring liquor and of cleaning the liquor for re-use. Patents for the refining and use of the grease are also described. W—4B.

Scouring and Grease Recovery: A New Method for Raw Wool. W. Fong, A. S. Yeiser, and H. P. Lundgren. *Text. Res. J.*, 1951, 21, 540-555. The effect of the lower primary aliphatic alcohols in aqueous solution on the scouring of raw wool by the natural suint salts is investigated. The amount of alkali required for effective grease removal decreases with increase in chain length of the alcohol. With the completely water-miscible alkalis at higher concentrations, grease is removed by the solvent action of the alkali whilst with a lower concentration of alkali a synergistic interaction with suint appears to occur. The method is exemplified by the most suitable conditions, *viz.*, a 3 per cent. solution of

n-butyl alcohol in water; with such a system, further addition of the alcohol to about 7 per cent. concentration (saturation) to the liquor after scouring causes the scouring emulsion to break and the grease and dirt to separate. **W—4B.**

Wool Processing with Synthetic Detergents. O. M. Morgan. *Amer. Wool & Cotton Rep.*, 1951, 65, No. 36, 9-10, 44. The advantages of synthetic detergents in scouring raw wool and skeins, and in scouring and milling woollen and worsted piece goods, are stated. Special reference is made to the use of Nacconol NR. **W—4B.**

Finishing Practice: (1) Woollen and Worsted Scouring. T. H. Sedgwick. *Dyer*, 1951, 106, 297-300. An account is given of scouring of woven goods with particular reference to its primary object, *viz.*, removing oils and other impurities. A theory of detergency is outlined and the practical procedure of scouring is detailed for each of the three main types of piece goods; worsteds, woollens and low woollens. Scouring machinery is described and the cause of temporary and permanent hardness in water and its treatment for scouring purposes are discussed. **W—4B.**

Washing: Theory. K. Swanston and R. C. Palmer. *J. Textile Institute*, 1951, 42, P675-P690. The properties of soap and detergent solutions, the sorption of detergent molecules at interfaces, the effect of salt in increasing adsorption, and the significance of detergent micelles, are briefly discussed. Details are given of the solubilisation theory of the mechanism of washing, and of Adam's theory, which is now generally accepted. The sorption of detergent by fibres, mechanical action, and the amount of detergent used in washing are considered in detail, with particular reference to wool washing. **W—4B.**

(D)—Milling

Bendler's Method for Controlling Milling. ("Sur une méthode de controle du foulage mise au point par M. Jean Bendler.") Justin-Mueller. *Teintex*, 1951, 16, 360, 363. A method is described for producing good results (on a mixture fabric containing 60 per cent. of wool) from a milling machine by ensuring that the required shrinkages are controlled to take place in a similar time in warp and weft. By doing this it is claimed that the milling time can be considerably shortened. **W—4D.**

Felting of Permanganate-treated Wool. (1) J. Lindberg, (2) P. Alexander. (1) *J. Soc. Dyers Col.*, 1951, 67, 192, (2) *ibid.*, 192-193. (1) Comments on Alexander's explanation of the behaviour of permanganate-treated wool in milling and felting. (2) Alexander's reply. **W—4D.**

(E)—Drying and Conditioning

Radio-Frequency Drying of Textile Fabrics. P. Alexander and G. A. Meek. *J. Soc. Dyers Col.*, 1950, 66, No. 10, pp. 530-537. An apparatus for studying the drying of textile fabrics by high-frequency (dielectric) heating is described. Rate-of-drying curves for thirteen different textile materials, together with measurements of temperature and power consumption, are shown. The practical advantages of high-frequency drying are discussed. There are twenty-five references. **C—4E.**

Damping and Shrinking on a Precision-built Machine. D. R. H. Williams. *Text. Mfr.*, 1951, 77, 351-352; *Wool Rec.*, 1951, 80, 43, 45. A new model of the Williams-Peace conditioning machine is illustrated and described (see *J. Textile Institute*, 1950, 41, A19). The steambox and water tank are made of stainless steel. The cast-iron damping rollers are mounted in ball-bearings and have a steel through shaft; they are sprayed on the face with stainless steel and have a precision-ground finish. The roller weight may be adjusted from 0 to 1,200 lb. to control the amount of moisture supplied. **W—4E.**

(G)—Bleaching

Continuous Peroxide Bleaching—a Decade of Experience. T. E. Bell. *Textile Age*, 1951, 15, No. 5, pp. 24-26 and 29-31 (and through *Chem. Abstr.*, 1951, 45, No. 12, p. 5413^{b}). High speed continuous peroxide bleaching methods are found to cost less and to yield better cotton fabrics. Each of the operations involved in the bleaching is described. **C—4G.**

Cotton: Peroxide Bleaching. T. E Bell. ("Continuous Peroxide Bleaching of cotton tubular knitted fabric.") *Knitted Outerwear Times*, 20/8/51, 19, (34), 15, 29, 31. Describes the development of equipment and bleach solutions suitable

for the continuous peroxide bleaching of cotton tubular knitted fabric. Formulation and procedure are given. Diagrams. H—4G.

(H)—MERCERISING

Mercerization of Viscose Staple Fiber Textiles and of Mixtures Containing such Fibers, and Identification. E. Cerbaro. *Boll. cotoniera*, 1941, 36, pp. 453-456 (through *Chem. Abstr.*, 1950, 44, No. 16, p. 7537°). When rayon is mercerised with aqueous caustic soda, swelling occurs, and the characteristic longitudinal striations, which normally are parallel to one another and to the long axis of the fibres, tend to be displaced and to run diagonally across the fibre, and to converge and diverge. This method may be used, in conjunction with dye-affinity tests, to identify mercerised rayon; photomicrographs illustrating the effect are reproduced. The fibres should be mounted in glycerine or in cedar-wood oil; the iodine/zinc-chloride reagent should not be used, as this itself causes swelling of the fibre. Methods of mercerisation are described. C—4H.

(I)—DYEING

Binding of Dyes by Native and Denatured Myosin Threads. A. D. Braun. *C. R. Acad. Sci. URSS*, 1948, 62, pp. 263-266 (through *Brit. Abstr.*, 1950, AII, November, p. 1242). Heat- or urea-denatured myosin is found to combine with more dye (Neutral Red, Methylene Blue, Nile Blue, Congo Red, Cyanol, Brilliant Green) than does native myosin. C—4I.

Colour Fastness: Development of Society of Dyers and Colourists' Standard Shades. P. W. Cunliffe. *Textil-Rdsch.*, 1951, 6, No. 5, pp. 227-229. In German. It is shown that the development of ranges of blue shades for the purpose of testing colour fastness followed similar paths in both Britain and Germany, prior to the war, after the Society had convinced the German Commission on Colour Fastness Testing that different ranges of colour on various fibres were not as suitable as the single range system. The statement is made in view of the tendency of Continental authors to ascribe the simplified method entirely to German sources. C—4I.

Coal-Tar Colors: Determination of Uncombined Alpha- and Beta-Naphthol. Lee S. Harrow. *J. Ass. Off. Agric. Chem.*, 1951, 34, No. 1, pp. 127-130. Methods are given for the extraction of the intermediates, alpha- and beta-naphthol (which are used in the preparation of numerous coal-tar colours), for coupling of the naphthol with *p*-nitrobenzene diazonium chloride, and for spectrophotometric determination of the colour produced. Recovery of the naphthols is between 88 per cent. and 100 per cent. There are five references. C—4I.

Dyeing Logwood Black on Acetate Rayon. A. Mathieu. *Rayonne*, 1950, 6, No. 6, pp. 91-92. In French. Excellent results have been obtained by the application of logwood black to acetate rayon on a jig-dyeing machine. C—4I.

The Dyeing of Terylene Polyester Fibre. E. Waters. *J. Soc. Dyers Col.*, 1950, 66, No. 12, pp. 609-615. This paper was delivered to the Manchester Section of the Society of Dyers and Colourists in April, 1949. The most suitable dyes for the new synthetic fibre, Terylene, are found to be the acetate rayon dyes. Terylene is a difficult fibre to dye, being vastly inferior in ease and rapidity of dying to acetate rayon and nylon. Phenolic substances, primary amines, hydrocarbons, and ether are found to be good carriers and increase the rate of dyeing. The temperature of dyeing and the choice of dye are very important factors. A modification of the azoic process has been found successful in producing the deeper shades. All combinations are said to be extremely fast to washing, and the normal finishing treatment recommended is to boil in alkaline soap solution. C—4I.

Dyestuffs: Fifty Years of Progress. Ernest A. Sack. *Teintex*, 1951, 16, No. 5, pp. 233-255 (12 pages). In French. C—4I.

Fastness of One-Colour Wool/Viscose-Staple-Rayon Knitting Machine Yarns. Karl Wojatschek. *Textil-Praxis*, 1948, 3, No. 12, pp. 398-399. In German. Processes involved in the dyeing of wool/viscose-staple mixture yarns are discussed with a view to achieving maximum fastness of the colour. Recommendations concerning dyes, formulations, after-treatments, *etc.*, are given. C—4I.

Dyes on Textile Fibres: Identification. R. Van Moeseke. *Textielwezen*, 1951, 7, No. 6, pp. 29-39 (7 pages). In Flemish. A scheme is presented for the practical identification of dyes on cotton and wool fibres. C—4I.

Indigo: Development, Production and Application. W. A. Vetterli, R. Haller and A. Bühler. *Ciba-Rundschau*, 1950, No. 93, pp. 3416-3441. In German.

Ciba Review, 1951, No. 85, pp. 3066-3091. In English. This series of papers on indigo discusses in detail the history of natural and synthetic indigo, various methods of dyeing and printing, and machinery employed. C—41.

Naphthols and Diazo Bases: Industrial Determination. F. Gasser. *Österr. Chem.-Ztg.*, 1950, 51, pp. 206-207 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4176[e]). Diazo bases and potassium iodide react with the development of nitrogen according to the equation: $RN_2Cl + KI = KCl + RI + N_2$. In a special apparatus the volume of the disengaged nitrogen is measured and the amount of the diazo base can be calculated. Naphthols are at first coupled with an excess of a suitable diazo base, followed by the determination of the remaining base with potassium iodide as described. Both methods, although not very exact, suffice in the textile industry for plant control work and comparison measurements. C—41.

Jubilee, 1900-1950. Manchester, The British Cotton and Wool Dyers' Association Ltd., 1951, viii + 40 pages. This souvenir volume deals generally, and lightly, with the activities of the firm in the production of various materials, and lists its different branches. C—41.

Indigoid Dyestuffs: Origin and Development. Ed. Kambli. *Ciba-Rundschau*, 1950, No. 93, pp. 3443-3445. In German. *Ciba Review*, 1951, No. 85, pp. 3093-3095. In English. The author discusses the structural characteristics upon which the development of the indigoid dyestuffs has been based, and the research work involved in preparing vat dyestuffs in leuco form. C—41.

Dyeing Rayon Hanks: Precautions to be Observed. P. Swillens. *Rayonne*, 1950, 6, No. 3, pp. 67-68; No. 6, pp. 69-72. In French. In discussing difficulties associated with dyeing rayon hanks, the author first deals with the physical and physico-chemical aspects of rayon structure and dye affinity. The dyeing process itself is then dealt with, under the headings: (1) influence of temperature; (2) influence of electrolyte concentration; (3) influence of levelling agents; (4) dye concentrations; (5) fixing salts. Certain rules concerned with these factors are put forward. C—41.

Simultaneous Dyeing and Finishing of Viscose Rayon. Raffaele Sansone. *Rayonne*, 1950, 6, No. 6, pp. 129, 131, 133-134. In French. A method is described whereby direct dyes can be applied to viscose rayon in a minimum of water which, at the same time, contains requisite finishing agents. Some details are given of dye/finishing-agent formulations and of the processing machinery. C—41.

Coal-Tar Colors: Studies. IX. Meyer Dolinsky and John H. Jones. *J. Ass. Off. Agric. Chem.*, 1951, 34, No. 1, pp. 114-126. The authors describe the preparation and purification of several fluorescein colours: D & C Yellow No. 7, D & C Orange No. 5, D & C Red No. 21, Tetrachlorofluorescein, D & C Red No. 27, and FD & C Red No. 3. Analytical data obtained on samples of the purified colours are given. Spectrophotometric data obtained on dilute aqueous solutions of the colours are presented as an aid in the identification and analysis of samples of these colours. There are five references. C—41.

Diazotization of *p*-Amino Dyes. S. F. Filippychev. *Doklady Akad Nank S.S.S.R.*, 1950, 73, pp. 731-734 (through *Chem. Abstr.*, 1951, 45, No. 7, p. 2922[h]). The difficulty in diazotising a number of *p*-amino dyes is explained by the undiazotisability of the quinoid hydrazone forms of the substances, existing in equilibrium with the normal azo structures in solution or suspension. A number of dyes having a stable hydrazone form have been studied: no diazotisation of the hydrazone form took place, but the azo form of the dyes reacted completely. The rates of diazotisation by two methods have been determined for a number of *p*-amino dyes. C—41.

A Dye Formed by the Naphthoresorcinol Reaction of Glucuronic Acid. Akira Ogata and Yasuhiko Nozaki. *J. Pharm. Soc. Japan*, 1943, 63, pp. 416-425 (through *Chem. Abstr.*, 1950, 44, No. 16, p. 7242[d]). A purple dye has been obtained by the reaction between glucuronic acid and naphthoresorcinol in glacial acetic acid in the presence of a dehydrating agent. C—41.

A Dye Formed by the Naphthoresorcinol Reaction of Glucuronic Acid. II. Yasuhiko Nozaki. *J. Pharm. Soc. Japan*, 1944, 64, No. 7A, pp. 9-10 (through *Chem. Abstr.*, 1951, 45, No. 8, p. 3599[d]). The purple dye formed by the reaction of glucuronic acid and naphthoresorcinol in aqueous solution has been shown to

be the same as that formed in glacial acetic acid (see previous abstract). The structure and properties of this dye are discussed. C—41.

Dispersol VI: Effect on the Dyeing Properties of Vat Dyes on Viscose Rayon. R. W. Speke. *J. Soc. Dyers Col.*, 1950, **66**, No. 11, pp. 569-575. It has been shown that the restraining effect of Dispersol VL upon leuco vat dyes is a function of the amount present in the system, and not of its concentration in the aqueous solution. A method of assessment of the relative sensitivities of individual leuco vat dyes has been evolved. By this method, the relationship between the dyebath exhaustion and the amount of Dispersol VL in the dyebath, obtaining under given dyeing conditions, is experimentally determined. A sensitivity factor can be calculated. Certain indanthrone derivatives show an entirely anomalous dyeing behaviour in the presence of Dispersol VL. Evidence is presented to show the influence on restraining effect of varying the depth of shade, the temperature of dyeing, and the salt concentration of the dyebath. Dispersol VL was found to improve the migration of leuco vat dyes, and there is a distinct correlation between improvement in levelling, and restraining effect. C—41.

Fibre Surface Roughness [and Dyeing Properties]. A. J. Hall. *Text. Merc.*, 1951, **125**, No. 3250, pp. 111, 113, 114. The author explains how the surface roughness of fibres influences the dyeing properties of fabrics. It is shown that rough fibres generally have a greater affinity for dyes than smooth fibres have. C—41.

The Fluorescent Dyes. A. J. Hall. *Text. Merc.*, 1951, **125**, No. 3252, pp. 199-201, 203-204. After briefly discussing the purpose, action, and nature of colourless fluorescent dyes or "optical bleaching agents", the author deals with various stilbene dyes and modern "brightening agents" developed from them. Finally a procedure for the fluorescent dyeing of cellulose acetate rayon is outlined. Reference is made to the relevant patent literature. C—41.

Metal Sequestering Agents in Textile Processing. Anon. *Fibres (Text. Industr.)*, 1951, **12**, July, pp. 229-230. (To be continued.) The article discusses the harmful effects of metallic salts in the water, or absorbed from the machinery used, in the dyeing, bleaching or rubber-proofing of textiles. Metal impurities which cannot be removed by a metal purification plant may be rendered inactive in the water by the addition of "sequestering" agents. These agents convert the metals into inactive complex substances. C—41.

Report of the Committee on the Dyeing Properties of Vat Dyes. *J. Soc. Dyers Col.*, 1950, **66**, No. 10, pp. 505-509. In a report on the work of this Committee since it came into being in March 1948, it is stated that three methods have been selected as suitable for dyeing with anthraquinonoid vat dyes. Details are given for especially designed migration and strike-levelling tests, which can be used for both anthraquinonoid and indigoid dyes. A rate-of-dyeing test was designed for mixtures. C—41.

Dyeing: Some Recent Developments in Theory. A. B. Meggy. *J. Soc. Dyers Col.*, 1950, **66**, No. 10, pp. 510-521. In the seventh John Mercer lecture, delivered in Bradford in April 1950, the author deals with the thermodynamics and kinetics of dyeing. Special attention is given to the free-energy change accompanying the absorption of a dye by a fibre (the affinity of the dye for the fibre). The affinity of several acids for wool, calculated (in gram-calories) from the *pH* of half saturation, are given in a table. Other tables list the affinity of various dye anions for wool at 60° C., the affinity of Metanil Yellow YK at various degrees of absorption at 60° C., and the affinity of direct dyes for cellulose. The nature of the forces holding the dye to the fibre is discussed, and it is explained how the attraction of water molecules for each other is an important source of the affinity of dyes for fibres. In dealing with the kinetics of dye absorption, or rate of dyeing, a method of calculating the activation energy is given. Brief mention is made of the fastness of dyes to wet treatment, and the compatibility of dyes used together. C—41.

Vat Dyeing: Studies. [I]. R. Haller. *Helv. chim. Acta*, 1950, **33**, No. 5, pp. 1165-1171. In German. The processes occurring in the "physical condensation" of vat-dyestuffs during dyeing are extraordinarily problematical. There is no dispersion of indigotin even in the presence of cotton fibres; on the other hand, decomposition of the fibre under the rigorous conditions of the condensation is observed, and the decomposition products indicate reactions

involving some hydrolysis of the cellulose. No satisfactory explanation can yet be offered to account for the penetration of the dyestuff through the cell wall—where there is greatest resistance—or for the formation, under certain conditions, of dyestuff crystals within the lumen. C—4I.

Vat Dyeing: Studies. [II]. R. Haller. *Helv. chim. Acta*, 1951, **34**, No. 3, pp. 793-797. In German. In continuing his work on the "physical condensation" of vat dyestuffs during dyeing, the author has made use of viscose rayon spun with an artificial lumen. An attempt is made to explain some of the differences in dyestuff deposition on these fibres as compared with vegetable fibres, and the development of crystals within the hollow space in the fibre. There still appears to be no explanation of the mechanism of direct penetration of the fibre wall by the dyestuff particles. C—4I.

Substantive Dyeing in the Light of the Most Recent Studies of the Structure of Swellable Substances. R. Haller. *Schweiz. Arch angew. Wiss. u. Tech.*, 1949, **15**, pp. 374-348 (through *Chem. Abstr.*, 1951, **45**, No. 1, p. 357°). Swelling studies on the cotton fibre have shown that the cell wall is built up of lamellæ which in turn consist of fibrils, and these fibrils contain corpuscles which are probably held together by a swellable cellulosic binder substance. Whereas the more coarsely dispersed substantive dyes, or their high molecular weight fractions, penetrate only the surface of the fibre, it is suggested that the more finely dispersed dyes or fractions are carried into the channels formed by the swollen binder substance. When a fibre is treated to inhibit swelling, it no longer takes up substantive dyes. The slow-swelling ramie fibre is penetrated very little by substantive dyes, and a dye layer on its surface comes off at once in sulphuric acid. Viscose rayon, on the other hand, which has lost most of the structural details of cotton fibre, is dyed throughout by substantive dyes. C—4I.

Wool Dyeing: Faults. Anon. *Wool Rec.*, 1951, **80**, pp. 475-479. Some faults and possible remedies are discussed under the headings: exposure and residues, washing, chlorination, carbonising, dyestuffs, piece-dyeing, and shade-matching. W—4I.

Dyeing: Evenness Control. H. White. ("Techniques of Colouring in the hosiery dye house.") *Hosiery Ind. Wkly.*, 8/51, **34**, (8), 147-8,150. Discusses the techniques which must be observed to overcome the problem of unevenness in dyeing, such as careful supervision, control of time and temperature, and the avoidance of too many dyestuff additions to the formula. H—4I.

Yarns: Package Dyeing. A. P. March. ("Package Dyeing of Natural and Synthetic Yarns.") *Knitted Outerwear Times*, 20/8/51, **19**, (34), 11, 34. Discusses package dyeing equipment for natural and synthetic yarns, methods of extracting excess water and drying. H—4I.

(J)—PRINTING

Printing Colours for Cellulosic Textiles: Properties and Applications. P. Hoton. *Rayonne*, 1950, **6**, No. 5, pp. 125, 127, 129; No. 6, pp. 73-75; No. 7, pp. 75-77; No. 8, pp. 91-93; No. 9, pp. 113-117; No. 11, pp. 91, 93-94; No. 12, pp. 60-62. In French. Continuing his series of articles on the nature of dyes and auxiliaries used in the printing of cellulosic textiles (see *J. Textile Institute*, 1950, **40**, A297), the author goes on to discuss the indigosols (continuation) and aniline black, and their application in printing media, at some length. C—4J.

Glycerine: Textile Application. A. Blanchart. *Rayonne*, 1950, **6**, No. 6, pp. 120-122. In French. The article outlines the sources of glycerine, and its structure, properties and textile applications. In its principal textile use, it is incorporated in printing pastes as a thickening agent; various paste formulations are given. Other minor uses of glycerine are in the sizing, dyeing and finishing industries. C—4J.

Printing on Cotton Fibers with Direct Dyes. V. E. Rostovtsev. *Tekstil. Prom.*, 1950, **10**, No. 8, pp. 26-28 (through *Chem. Abstr.*, 1951, **45**, No. 1, p. 357^{h}). A complex of bivalent copper with glycerol may be introduced into the printing colour, followed by fixation on the fibre after ageing. An alternative method, involving initial fixation in the ageing apparatus, is used when a brighter and more vivid colour is desired. C—4J.

Colour Mixing for the Textile Printer. Anon. *Text. Rec.*, 1951, **69**, pp. 87-88. A review of considerations for the colour mixer. The use of various thickenings is mentioned, as is the use of chrome mordant and azoic dyes and the fixing

power of Persian berry extract on basic dyes. The advantages and use of vat colours are explained. W—4J.

(K)—FINISHING

The Alkylsulphosuccinates. H. Stüpel and A. von Segesser. *Textil-Rdsch.*, 1951, **6**, No. 6, pp. 255-268. In German. The aspects of the alkylsulphosuccinates discussed here are: constitution, properties, wetting power and surface activity, behaviour in acid and alkaline solutions, stability in soap solutions, foaming power, and applications. Numerous tables and graphs are given. C—4K.

Aspects of Emulsion Applications in Textile Processing. Anon. *Text. Mfr*, 1951, 77, March, pp. 140, 141-142. Some applications of emulsions in the following fields of the textile industry are discussed: (*a*) soaps and synthetic detergents, (*b*) finishing (waterproofing, crease resistance, and silk brightening), (*c*) fibre and fabric treatments (for example, jute lubrication, and animalising and basifying fibres), and (*d*) textile printing. C—4K.

Plastic Treatment of Rayons. Narao Saito. *Teifin Times*, 1950, **20**, No. 6, pp. 1-2. In English (through *Chem. Abstr.*, 1950, 44, No. 16, p. 7541). Ordinary rayon yarn, treated with thermoplastic and thermosetting plastics together with a cationic reagent in a mixed colloidal state, and then cured for 1-15 minutes at 130° C., showed higher wet strength and higher elongation at break than either untreated yarn or urea-formaldehyde treated yarn. C—4K.

Finishing of Textiles: Systematic Chemistry. E. I. Valko. *Sitzungsber. Öster. Akad. Wiss.*, 1950, **159**, (1-2), pp. 260-265 (through *J. Soc. Dyers Col.*, 1950, **66**, No. 12, p. 662). This paper is based on a lecture to the American Chemical Society on 29th March, 1949, in which the author proposed a topological and scientific study of recent new processes for the improvement of textiles. The topological study would distinguish between processes which occur (*a*) within the separate fibres, (*b*) between the fibres, and (*c*) between the yarns. The scientific study would distinguish various mechanisms of fixing the finishing materials employed, (1) by previous destruction and restoration of the cohesion of the fibre material or of the finishing agent; (2) by adhesion of the agent to the fibre by means of subsidiary or main valency forces. C—4K.

Polymerisates in Textile Finishing. Franz Weiss. *Textil-Rdsch.*, 1950, **5**, No. 12, pp. 487-497. In German. The author discusses the application of the more useful vinyl polymerisates to textile fabrics. These substances include the polyvinyl chlorides, polyvinylidene chlorides, polyacrylic acid esters and other polyacrylic acid compounds, and polyvinyl-acetates. The behaviour of aqueous suspensions is described. Formulations are given for use in the leathercloth and textile finishing industries. C—4K.

Wool: Plasticity. ("La Plasticité de la Laine.") J. B. Speakman. *Bull. Inst. Text. France*, 1951, No. 26, 65-84. The plasticity of wool is of importance in many processes, especially in finishing. A precise measure of this plasticity has been found by determining the rate of extension of wool fibres in water under constant load. This experiment, and the conclusions obtained from it, are described. As wool fibres are weakened by plastic flow, weakening should be corrected later by heat-treatment in water. The best conditions for this are given. Some recovery takes place whenever wool is rested after relaxation; this recovery accords with the practice of resting the material between finishing processes, as well as with the increased strength apparent in stored wool fabrics. W—4K.

(L)—PROOFING

Fire-Resistant Textiles. G. S. Buck, Jr. *Encyclopædia of Chemical Technology (Interscience)*, 1951, **6**, pp. 543-558. This reprint deals generally with the subject under the following headings: definitions, action of fire-retardants, types of fire-retardants, chemical combinations with cellulose, test methods, and uses of fire-resistant textiles. There are thirteen references. C—4L.

"Eulan," its Use and Importance. ("'Eulan,' seine Anwendung und Bedeutung"). —. Drapal. *Textil Praxis*, 1951, **6**, 443-444. A short account is given of "Eulan" moth-proofing agents, the general and special properties of the different varieties, and their respective methods of use. W—4L.

PATENTS

Water-Repellent Finishes: Production. Imperial Chemical Industries Ltd., William Baird, Thomas Barr, E. S. Lane and Arthur Lowe. B.P.645,138: Appl. 7/10/1947 and 5/5/1948; Filing 6/10/1948; Publ. 25/10/1950. The claims are for the production of compounds of the general type

$$R\begin{cases}(O\cdot CO\cdot NH\cdot CH_2\cdot OH)_m\\(O\cdot CO\cdot NH\cdot CH_2\cdot AX)_n\end{cases}$$

for use as finishing agents for securing water-repellency and, in many cases, crease resistance. R is a hydrocarbon radical, A the group of atoms characteristic of an aliphatic or heterocyclic tertiary amine, X is a monovalent anion, m is zero or a whole number, n is a whole number, and $m+n$ is greater than 1. These compounds are generally obtained by the interaction of a polycarbamate, $R(O\cdot CO\cdot NH_2)_{m+n}$, with formaldehyde, and (1) the salt of a tertiary amine, and/or (2) an addition compound of a tertiary amine with an inorganic acid anhydride. Twenty-seven examples are given in detail. C.

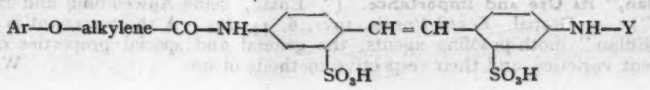
Variably Twisted Yarn: Application in Differentially Dyed Fabrics. British Celanese Ltd. B.P.645,148: Appl. and filing 9/12/1947; Publ. 25/10/1950; U.S.A. appl. 11/12/1946. Differentially coloured materials are obtained by dyeing yarns (or fabrics knitted or woven from them) that are uniform in count, but variable in twist over the range 10 to 25 turns per inch. For example, 3-denier cellulose acetate staple fibre is spun into yarn with random variations in twist from 11 to 24 t.p.i., two ends are knitted together, and the fabric is dyed with 1:4-di(methylamino)-anthraquinone. A flecked appearance results, the darker spots occurring where low-twist portions of the two ends come together and the lighter spots where high-twist portions come together. C.

Direct-Dyeing Cellulose Acetate Textiles: Production by Partial Saponification. British Celanese Ltd. B.P.645,761: Appl. and filing 24/2/1948; Publ. 8/11/1950; U.S.A. appl. 24/2/1947. Cellulose acetate textile materials having an acetyl content (calculated as acetic acid) above 56 per cent. (for example, high-tenacity yarn) are partially saponified to an acetyl content of 53-55 per cent., by treatment with 1-5 per cent. sodium carbonate (for example, 2·5 per cent.) at 80-100° C. (for example, 97° C.). The products give level dyeings with direct cotton dyes and are resistant to ironing. C.

Textile-Printing Machine Box-Wheel Drive. Bollington Printing Co. Ltd. and Arthur Lewis. B.P.645,782: Appl. 22/9/1948; Filing 22/9/1949; Publ. 8/11/1950. This box-wheel drive has a worm, journalled on the box wheel, and engaging the worm wheel keyed to the mandrel. Relative movement between the box wheel and mandrel is provided through a pair of helical pinions on the ends of the worm, which engage a scroll thread on one half of a differential gear, and pawl means are provided for preventing the rotation of either half of this gear, to allow for the rotation of the worm wheel relatively to the box wheel in a clockwise or anti-clockwise direction. C.

Dyed Wool: Process for Stripping Colour. Fabric Research Laboratories Inc. B.P.652,899 of 2/5/1951. Dyes may be stripped from wool or other animal fibre material by immersing it in the liquor driven directly from the cathodic region of an electrolytic cell, and containing vanadium, titanium or chromium ions in a low valency state. The process may be carried out by immersing the wool in the cathodic region of the cell, but it is preferable to circulate the liquor from the cathodic region of the cell through the wool in a separate container and back to the cell. Current is passed through the cell throughout the operation, so that the concentration of low valency ions is continuously maintained. Good results are obtained above 75° C., but temperatures in the range of 85° C. to 95° C. are preferred. Compared with the usual formaldehyde-sulphoxylate stripping agents, the method is more efficient in decolorising the dye and does not affect the handle and strength of the material. W.

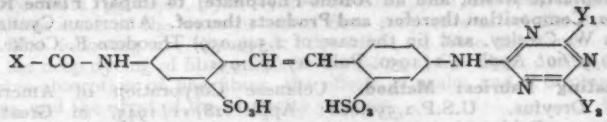
Brightening Agents: Manufacture. J. R. Geigy A.-G. B.P.654,028 of 30/5/1951. Optical bleaching agents consist of 4:4′-diaminostilbene derivatives of the general formula:



(Ar=an aromatic radical, alkylene=an alkylene radical and Y=the radical of a 1:3:5-triazine ring which may be substituted in the 3:5-positions, by primary, secondary or tertiary amino groups). They have good affinity for the wool fibre, on which they have very good fastness to light and wet conditions. They increase the whiteness of undyed wool and give brilliance to wool dyed in light shades. W.

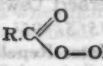
Treatment of Materials consisting Wholly or Partly of Wool. Tootal Broadhurst Lee Co. Ltd. B.P.654,739 of 27/6/1951. Materials consisting wholly or partly of wool are placed in contact with a finely-divided solid compound which liberates fluid halogen, *e.g.* bleaching powder. The materials are embedded or rolled in the halogen compound, which is shaken and/or brushed from the fabric, which is then washed, using an anti-chlor, *e.g.* sodium bisulphite. The fabric has increased affinity for dyes and reduced tendency to felt. W.

Brightening Agents: Manufacture. J. R. Geigy A.-G. B.P.654,779 of 27/6/1951. Optical bleaching agents for protein fibres consist of melamine derivatives of the general formula:



(X=a lower alkyl or alkoxy radical, Y_1 and Y_2 each=the primary amino group, or secondary or tertiary amino groups substituted by lower aliphatic, alicyclic or arylaliphatic radicals, or by radicals of the benzene series which may have further non-auxochromic substituents, *e.g.*, sulphonic acid). They may be applied in a neutral, or weakly acid bath. They have a good brightening effect, and good fastness to acid, laundering and sea water. W.

Treatment of Materials Consisting Wholly or Partly of Wool. Wolsey Ltd. B.P.656,938 of 5/9/1951. The felting shrinkage of materials consisting wholly or partly of wool is reduced by treatment with a compound of the general formula



(R=hydrogen or an alkyl, aryl, substituted alkyl, or substituted aryl group, and M=hydrogen or a metal), in a solvent, *e.g.* carbon tetrachloride, which does not decompose the compound. The compounds preferred are performic, peracetic and perbenzoic acids. The regain of the wool is preferably 14 per cent. The compounds may be applied in aqueous solution at *pH* below 11. Hydrogen peroxide, alkyl hydro-peroxides, dialkyl peroxides, esters of aromatic peracids, benzoyl peroxide, substituted benzoyl peroxides, and acyl benzyl peroxides do not produce satisfactory shrinkage reduction. W.

Biocidal Composition. E. M. Owen (to General Aniline & Film Corporation). U.S.P.2,536,983 of 2/1/1951. A biocidal composition consists of a carrier containing a resin obtained by reacting aromatic primary or secondary amines with formaldehyde and dicyandiamide. In an example, 37·8 g. of the condensation product of aniline, formaldehyde and dicyandiamide is gradually added to 28·8 g. of heated caprylic acid; the resulting product is ground to a powder, which, dispersed in carbon tetrachloride, is effective for the mothproofing of wool. W.

Wool: Treatment to Prevent Felting during Wet Processing. M. J. Reider (to G. W. Bollman & Co. Inc.). U.S.P.2,541,780 of 13/2/1951. The felting shrinkage of wool is reduced by clogging the surface scales with finely-divided material, and washing the wool, a detergent being added at one of these stages. Finely-divided material with a negative charge is suspended in water containing an acid to give *pH* 2·0–3·5; with a positive charge, the suspension has *pH* 8·5–11·0. W.

Resin Treatment of Wool Fabric. J. N. Dalton and W. B. Kaupin (to Pacific Mills Inc). U.S.P.2,545,450 of 20/3/1951. A wool, or part wool, fabric is impregnated with an aqueous solution or dispersion of a resin-forming material and an acid catalyst; excess liquid is squeezed out and the fabric heated by infra-red or radio-frequency radiation, the heating being so rapid that the resin becomes viscous, and its distribution is homogeneous throughout the fabric; the resin is finally polymerised by heating, preferably by infra-red radiation.

The treatment is continuous. The fabric resists shrinkage on laundering, and is soft and flexible, whilst the treatment enhances the fixation of acid dyes. W.

Dyeing: Apparatus. J. M. Rugh. U.S.P.2,548,740 of 10/4/1951. Apparatus for dyeing fibrous material, *e.g.* loose wool, has means for circulating the liquid to create less pressure in the upper portion of the closed vessel. The compression of the wool is lessened, thus allowing a more uniform distribution of the liquid, so as to finish the wool in a more uniform and fluffy state. Heating and cooling arrangements are also provided. W.

Shrinkproofing Wool. M. R. Coe, Jr. U.S.P.2,548,774 of 10/4/1951. Wool is subjected for 5-10 minutes in a closed chamber under super-atmospheric pressure and at a temperature above 100° C. to very dilute solutions of potassium permanganate or other oxidising agents. The pressure used is 5-15 lb. per square inch. The wool is bleached, rendered non-felting, and given increased level-dyeing properties. W.

Method of Treating Fibrous Cellulosic Materials [with a Metallic Oxide, a Thermoplastic Resin, and an Amino-Phosphate] to Impart Flame Resistance thereto, Composition therefor, and Products thereof. American Cyanamid Co., Joseph W. Creeley, and (in the case of 2,549,059) Theodore F. Cooke. U.S.P. 2,549,059/60: Appl. 1/2/1950; Publ. 17/4/1951. C.

Laminating Fabrics: Method. Celanese Corporation of America, and Henry Dreyfus. U.S.P.2,550,006: Appl. 28/11/1945, in Great Britain 11/12/1944; Publ. 24/4/1951. C.

Dyeing and After-Treating Fibers: Apparatus. General Dyestuff Corporation and Sumner H. Williams. U.S.P.2,552,078: Appl. and filing 9/1/1945; Publ. 8/5/1951. C.

Dyeing Spun Cellulose Derivative Staple Fibers in Alcoholic Solutions and then Skying. Celanese Corporation of America, Wilfred T. Normand, and William J. Cramer, J. U.S.P.2,552,807: Appl. 7/10/1947; Publ. 15/5/1951. C.

Liquid Treatment of [Rayon Cake] Packages of Yarn: Apparatus. Oscar Kohorn & Co. Ltd., and Herbert Oswald Naumann. U.S.P.2,553,106: Appl. and filing 26/7/1946; Publ. 15/5/1951. C.

Method of Rendering Materials Water Repellent [by Treatment with Organo-silicon Amines]. General Electric Co., and Charles P. Haber. U.S.P.2,553,314: Appl. 1/7/1944; Publ. 15/5/1951. C.

Rosin Amine Treated Natural Cellulose Fibers. United States Rubber Co., and Joseph M. Almond. U.S.P.2,553,396: Appl. 2/8/1948; Publ. 15/5/1951. C.

Flame Resistant Cellulose Fibrous Materials and Method of Making Same [with Borax/Boric-Acid and a Wetting Agent]. Lockport Cotton Batting Co., and Ralph R. Oliver. U.S.P.2,553,781: Appl. 14/4/1950; Publ. 22/5/1951. C.

Slitting Rubber-Backed Textile Fabric: Machine. Sidney Blumenthal & Co. Inc., Duncan Ferguson, Nelson MacDougall, and Ernst P. Meyer. U.S.P. 2,554,298: Appl. and filing 27/12/1948; Publ. 22/5/1951. C.

Wool Washing Process. F. Fiala, Sen. French Patent 970,648 of 8/1/1951. Raw wool is cleansed by treatment in one or two baths of paraffin, b.p. 100–350° C., which has been purified by a light nitration process. The wool is then squeezed and the liquid retained, left for 5–10 minutes in cold water, again squeezed and the liquid again retained, and left for a further 5–10 minutes in cold water. It is finally squeezed, centrifuged, and dried at 50–60° C. The paraffin can generally be used six times, and then is recovered by distillation for further use. No heating is required, and there is no felting of the wool. The usual by-products can be recovered from the retained liquid. Apparatus for carrying out the process is described. W.

5—ANALYSIS, TESTING, GRADING AND DEFECTS

Evaluation of Experimental Results. Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, 5, No. 12, pp. 507-515 In German. Swiss Standard Method, SVMT25: A32, contains directions for evaluting experimental results when making simple tests on materials, and for making use of frequency curves. The rules are valid only for an experimental series where individual values are likely to fall into a normal statistically governed arrangement, that

is, a symmetrical binomial series. Experimental procedure and material must remain constant. There are six references relating to the evaluation of more complex investigations than those dealt with in the standard method. C—5.

(A)—FIBRES

Angle of Torsional Rupture: Significance in Synthetic Fibre Structure Investigation (Conclusion). Paul-August Koch. *Textil-Rdsch.*, 1951, 6, No. 6, pp. 281-285. In German. The new method for the measurement of the angle of torsional rupture of fibrous materials is applied to various kinds of rayon and synthetic fibres. Tests show that this angle discloses differences in fibre structure brought about by variation in production methods, particularly in stretching. Values for the angle of break are given for various rayon and synthetic fibres and filaments, and variation in properties with degree of stretch is demonstrated by a series of tests on similar fibres. (See *J. Textile Institute*, 1951, 42, A393.) C—5A.

Dyeing of Fabrics: Influence of Fibre Properties. A. J. Hall. *Text. Mfg.*, 1951, 47, No. 1211, pp. 1506, 1508, 1510; No. 1215, pp. 1782, 1784, 1786. This paper outlines some of the ways in which fibre properties affect the dyeing of fabrics. The following are discussed: the effect of fibre thickness, uneven singeing, the deep dyeing of fibre ends, the breakage of fine fibres during dyeing, the low dye-absorption of fine fibres, the effects of scales and "tippiness" of wool fibres, and the effect of the plasticity of fibres. C—5A.

Absorbent Cotton [and Other Fibres]: Manufacture and Testing. E. Cerbaro. *Boll. cotoniera*, 1942, 37, pp. 247-250, 366-367 (through *Chem. Abstr.*, 1950, 44, No. 16, p. 7535[e]). Methods of manufacture of absorbent cotton and other fibres are described, as well as standards and methods of test based on German practice. The mean fibre length should be not less than 20 mm., and ash content not more than 0·3 per cent.; 10 c.c. of an extract prepared by boiling 50 g. of heat-sterilized wadding with 150 c.c. of carbon-dioxide-free water should give no reaction for sulphate or chloride, and should be neutral to phenolphthalein, and almost clear and colourless. Water absorbency is assessed by the rate at which a compressed ball of wadding sinks when placed on water (Moser's method). The degree of degradation (Schwalbe's method) should be not more than 0·5 and 1·25 for non-sterilised cotton and viscose rayon respectively, corresponding figures for sterilised fibres being 0·65 and 1·40 respectively. C—5A.

Viscose Rayon: Detection of Mechanical Damage by Microscope. Alois Herzog. *Faserforsch. u. Textiltech.*, 1951, 2, No. 4, pp. 140-141. In German. Solutions of diphenyl- and triphenyl-carminic acids (Dikar and Trikar) differentiate clearly between the outer layer and the interior of viscose rayon, in that the former is stained pink and the latter a pronounced green. The use of either of these dyestuff solutions gives a ready identification of rayon fibre damage when examined under the microscope. C—5A.

Textile Raw Materials Packed in Bales: A New Method of Assessing the Value of. Léon Goossens. *Rayonne*, 1950, 6, No. 6, pp. 98-100. In French. The author discusses some aspects of core-testing of pressed bales. He puts forward a sampling technique, explaining the statistical principles on which it is based, and comments on the cost of the method, and the accuracy it achieves. C—5A.

The Orifice Test as a Method for Studying Closing Capacity of Cotton Fiber in the Raw State. Lorraine W. Scott, Daniel J. Barrett and Mary L. Rollins. *Text. Res. J.*, 1951, 21, No. 3, pp. 148-155. The adaptability of the orifice test for the measurement of closing capacity (to water penetration) of cotton in fibrous form has been investigated. Seepage of water through bundles of loose, paralleled, but unspun fibres is compared with that through yarns, and through immature fibres. A method was devised for determining the effective amount of air space per unit weight of the fibre in the orifice. This, with other important factors, was found to influence the resultant seepage of water. There are six references. C—5A.

Fibre Properties and Handle of Fabric: Relationship. ("Some Relations of Fiber Properties to Fabric Hand.") R. M. Hoffman and L. F. Beste. *Text. Res. J.*, 1951, 21, No. 2, pp. 66-77. Methods of measuring the following fabric properties are discussed, and attempts are made to relate them to properties of

the fibre: stiffness, "compliance", liveliness, weight, leanness and bulk, compressibility and thickness, waxiness, friction, "contact warmth", drape, smoothness and lustre, visual covering power, and contour retention and resilience. The handle, liveliness and shape retention of fabrics are said to be controlled in large measure by three fibre properties: the initial stiffness, the change in stiffness as the deformation or load is increased, and the recovery behaviour when the load is removed. Other factors such as fabric construction and interfibre friction play only a secondary rôle. There are twenty-nine references. C—5A.

Staple Diagram: Swiss Standard Method. Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, 5, No. 11, pp. 460-462. In German. Swiss Standard Method SVMT25: B1011 lays down rules for sampling the raw material or yarn, and for interpreting results of a staple diagram prepared from them by individual measurement of fibres straightened out (but not stretched) on a suitable surface such as a felt pad or oiled glass surface marked off in square millimetres. C—5A.

Cellulose Fibers: Structure and Mechanical Behaviour. P. Herrent and A. Lude. *Text. Res. J.*, 1951, 21, No. 3, pp. 137-143. Believing that the reticular concept of the internal structure of cellulose gels does not adequately account for many of the properties of the gels, the authors propose another structure. This structure is a double network of macromolecules. The primary network is an assembly of meshes, the knots of which are small crystallites. The secondary network consists of bundles of macromolecular chains which lie at the sides of the meshes, and which are held together by secondary bonds that ensure cohesion for the whole. C—5A.

A Study of the Effects of Form Factors on the Translation of the Inherent Physical Properties of Textile Fibers into Textile Structure. Walter J. Hamburger, Milton M. Platt, and Marcelotte W. Ross. *U.S. Quartermaster General Textile Series Report*, No. 59, 1949, 308 pages. This is a literature survey consisting mainly of abstracts from the *Journal of the Textile Institute*. It deals with the literature prior to 1947, and was sponsored by the Quartermaster General, U.S.A. It has now been released for public information by the Office of Technical Services, U.S. Department of Commerce. The abstracts are arranged in two parts: one dealing with mechanical behaviour and plastic theory, the other with sub-fibre structure, testing, fibres, yarns, fabric, and modification of properties through finishing. C—5A.

Regenerated Celluloses: Study of Shrinkage in Water and Hygroscopicity. A. B. Pakshver, S. S. Frolov, and N. N. Filatova. *Tekst. Prom.*, 1950, 10, No. 12, pp. 18-20. In Russian. *Faserforsch u. Textiltech.*, 1951, 2, No. 4, pp. 167-169. In German (translated by R. Wittwer). Various types of viscose and cuprammonium rayons and staple fibres have been examined with respect to (1) their solubility in ten per cent. sodium hydroxide solution (Neumann and Fokina method), (2) their hygroscopicity under tension when suspended over water (Neumann and Kargin), and (3) their contraction or elongation in water and in four per cent. sodium hydroxide solution (Weltzien). After commenting on the data, the authors express the opinion that the tests provide a practical means for characterising regenerated celluloses. C—5A.

Textile Chemical Investigations of Fibres: Methods. Andreas Agster. *Textil-Praxis*, 1948, 3, No. 12, pp. 396-398. In German. A system for the identification of textile fibres is outlined. C—5A.

Textile Materials. Anon. *A.S.T.M. Proceedings*, 1950, 50, pp. 366-374. The report of Committee D.13 includes (p. 370) recommendations affecting standards for textile materials. C—5A.

Artificial Fibres. IV. Weakness of Partially Nitrated Artificial Fibres. Hideo Oe. *J. Soc. Text. Cellulose Ind.* (Japan), 1945, 2, pp. 39-44 (through *Chem. Abstr.*, 1951, 45, No. 4, p. 1771[i]). Five kinds of viscose fibres were partially nitrated, and measurements of their tensile strength, solubility in acetone, nitrogen content, and elongation with a load, were carried out. The tensile strength of a single fibre decreased at the beginning of nitration, but after sufficient nitration (two nitro groups for every three hydroxyl groups) the strength recovered to normal while the elongation increased 150 per cent. C—5A.

Fibril-like Structure of Rayon Fibers. Isao Okamura. *Teijin Times*, 1951, 21, No. 3, pp. 11-13. In English. (Through *Chem. Abstr.*, 1951, 45, No. 12,

p. 5403[d]). The author discusses the structure and physical properties of rayon fibres in relation to the arrangement of the long molecular chains which make up their polymolecular particles. C—5A.

Peeling of the Skin of Viscose Fibers. Isao Okamura. *Teijin Times*, 1951, 21, No. 2, pp. 1-3. In English. (Through *Chem. Abstr.*, 1951, 45, No. 12, p. 5404[b]). Investigations show that changes in Young's modulus and in elasticity occur when the outer layer of viscose fibres are acetylated and when acetate fibres are superficially saponified. Viscose and acetate fibres are found to differ diametrically in the skin and core properties, although both can be dyed with direct colours. C—5A.

Tensile Properties of Cellulose Fibres Under Wetting Conditions. Parts VI-IX. Michiharu Negishi. *J. Soc. Text. Cellulose Ind.* (Japan), 1946, 2, pp. 34-38; 1947, 3, pp. 21-24; 60-63; 63-65 (through *Chem. Abstr.*, 1951, 45, No. 4, p. 1772[e]). **VI.** Highly polymerised refined ramies lost (like cotton) the abnormality of having a large increasing wet tensile strength, when stretched 1-2 per cent. while immersed in water, and then dried in air or stretched slightly more and left in water for three hours. Higher stretching markedly increased the dry tensile strength. An X-ray examination of the stretched ramie fibres was made. **VII.** Momentary stretching of cotton and ramies in water produced the above effect, the wet and dry tensile strengths coming closer together. **VIII.** Cotton and ramies stretched (2-4 per cent.) momentarily in water showed flattened and more distinct interference rings, indicative of more crystallisation and better molecular arrangement. **IX.** Commercial viscose rayon with no abnormally large wet tensile strength showed hardly any change in the X-ray picture after being stretched in water. C—5A.

Topics on Textiles. XII. Mantle Fiber. [The "Skin" of Viscose Rayon]. Isao Okamura. *Teijin Times*, 1950, 20, No. 10, p. 3. In English. (Through *Chem. Abstr.*, 1951, 45, No. 1, p. 358[h]). Herman's mantle fibre (or "skin") of viscose rayon can be eliminated by treating with some swelling reagents. The skin area, amounting to 39·6 per cent. of the total viscose sectional area, was entirely removed by immersion in 5 per cent. sodium hydroxide, while the knot strength per tensile strength increased from 36·5 to 72·8 per cent. C—5A.

Wool: Nature of the Canary Coloration. J. A. Serra and R. M. A. de Matos. *J. Textile Institute*, 1951, 42, T329-T331. Canary stain has been found to originate in a decomposition of the cystine residues of the wool. The stain was reproduced by treating the wool with alkaline buffer solutions, or with sodium hydroxide. There is correlation between the *pH* of the suint and the colour of the wool. The nature of the products which give the yellow coloration, and which appear as the result of alkaline attack, is discussed. W—5A.

Wool: Its Textile Future. W. R. Lang. *Pastoral Rev.*, 1951, 61, 257-258. A short survey of the physical properties of fibres, a comparison being made of the performance of wool, and of man-made fibres as possible substitutes for wool. W—5A.

Ballistic Determination of Work of Rupture of Short Textile Samples. W. R. Lang. *J. Textile Institute*, 1951, 42, T314-T328. Modifications of the ballistic pendulum to permit the measurement of the work of rupture of short textile samples of a minimum length of 0·1 inch are discussed. After examining various modifications, a stationary crossbar-clamp method was adopted. Details are given of the application of the method to the work of rupture of wool staples at a given level, the detection of damage at certain staple levels, and the estimation of the degree of felting. W—5A.

A Wool Medullameter. R. E. Belin and C. L. Goldstone. *J. Textile Institute*, 1951, 42, T332-T334. A modification of the apparatus described by McMahon (*J. Textile Institute*, 1937, 28, T349). The wool sample is immersed in benzene and evenly illuminated. Light scattered in a vertical direction is measured by means of a photocell and a d.c. amplifier. The output is proportional to the light falling on the photocell cathode, which in turn is dependent on the hairiness and the weight of the wool sample. Knowing the weight of the clean dry sample, a numerical index of its relative medullation is readily obtained from the meter reading. A diagram of the instrument is given. W—5A.

Hair: Effect of Tension on Water Absorption. L. R. G. Treloar. *Nature*, 1951, 168, 521-522. The experiments of White and Stam on human hair (*J. Textile Institute*, 1949, 40, A246) have been repeated using horsehair. An increase in water content was found on applying tension which, though small, was consistent and reproducible. This effect is in the opposite direction to that found by White and Stam. W—5A.

Wool Fibres: Examination. E. Hardy. ("Wool Fibres under the Microscope.") *Hosiery Trade J.*, 8/51, 58, (692), 52. 4. Discusses the preparation of samples and the purchase of sample sections of processed wools for comparison and identification purposes. H—5A.

(B)—YARNS

Yarn Structure: Certain Aspects. Edward R. Schwarz. *Text. Res. J.*, 1951, 21, No. 3, pp. 125-136. A plea is made for the better understanding of the geometry and structure of yarns and their effect on the behaviour of fabrics. The subject of yarn structure is dealt with under the following headings: importance of twist, the concept of tortuosity in twist measurement, packing of units into the yarn structure, relationship of core and outer layers, theoretical considerations due to packing, importance of placement of units in blending, corkscrew and tendril effects, and concept of helix diameter and the structural coefficient *k*. There are nine references. C—5B.

Law of Critical Yarn Diameter and Twist: Influence on Yarn Characteristics. L. Hermanne and G. Quintelier. *Text. Res. J.*, 1951, 21, No. 3, pp. 166-168. A formula is developed for the relation between contraction and twist of a simple continuous yarn. C—5B.

Yarn Testing Machine: Balance-Type Dynamometer. Etablissements Marcel Defraine. *Rayonne*, 1950, 6, No. 5, pp. 131, 133-135. In French. (See *J. Textile Institute*, 1951, 42, A171.) C—5B.

(C)—FABRICS

Adhesion of Rubber and Textiles: Effect of Amount of Spun Staple Yarn in Textile. E. M. Borroff, R. S. Khot, and W. C. Wake. *Ind. Engng Chem.*, 1951, 43, No. 2, pp. 439-442. This paper is one of a series on the adhesion of natural and synthetic rubbers to textiles. The ultimate aim of the work is the designing of textiles to give improved adhesion. The strength of the bond is found to be a function of the number of fibre ends protruding from the textile and of the number broken off in the rubber. The textile, if of rayon or synthetic fibres, should be constructed with a small percentage of spun staple, the fibres of which have high individual tensile strength. A continuous filament warp and a suitable arrangement of picks of continuous filament and spun staple yarns will give the required adhesion. The use of sateen weaves with spun staple on the weft face, which has also to be proofed, enables fabrics with good adhesion characteristics also to have the sheen characteristic of continuous filament materials. (See *J. Textile Institute*, 1950, 41, A128 and A129.) C—5C.

Accelerated and Natural Weathering Tests of Protectively Finished Cotton Duck: Correlation Studies. P. J. Fynn, Catherine N. Daly, Constance M. Fleming and J. D. Dean. *Text. Res. J.*, 1951, 21, No. 2, pp. 116-123. Artificial and natural weather exposure tests were made with unfinished and with protectively finished cotton duck samples. The treating agents used were chiefly mineral pigments, film-forming resins, and vat dyes, alone and in combinations. The finishes were ranked in order of excellence on the basis of amounts of original strength retained by individual samples in both types of exposure. Statistical interpretation of the data indicated a positive correlation between the two types of tests, but the relationship was not sufficiently constant to justify reliance on the accelerated techniques employed in predicting the behaviour of finished cotton textiles in outdoor service conditions. There are eight references. C—5C.

Rubber Stocks: Determination of Tackiness. E. Schmitt. *J. Rubber Research*, 1948, 17, pp. 195-202 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4475[i]). The stock is applied to a fine spun cotton (Nissl) fabric by calendering, and the tack is measured with a pendulum elastometer, the customary vulcanizate test-piece and also the suitably modified pendulum hammer being surfaced with the rubbered fabric. The degree of tack is indicated by the loss in the recoil elasticity and the number of pendulum beats. The modified elastometer is described and results are quoted for typical stocks. The effects of incorporation of a plasticizer,

freshening with benzine, and the application of various adhesive solutions, are also reported. C—5C.

Polymolecularity of Viscose Rayon and Rayon-Grade Pulps. W. E. Davis. *Ind. Engng Chem.*, 1951, 43, No. 2, pp. 516-521. The relation between fatigue resistance in tyre-cords of viscose rayons prepared from chemical cotton and wood pulps, on the one hand, and molecular weight and molecular-weight distribution of the rayons and original celluloses, on the other, has been studied. Fatigue resistance is found to correlate fairly well with the amount of low molecular weight material in the rayon, while tenacity correlates with weight-average molecular weight. A strong correlation is found between the amounts of low molecular weight material in the pulps and in the corresponding rayons. The results suggest ways of improving rayons made from wood pulps. There are eighteen references. C—5C.

Water-Repellency of Fabrics: Spray Test. Swiss Society for Testing Technical Materials. *Textil-Rundschau*, 1950, 5, No. 11, pp. 463-464. In German. Details are given of the Swiss Standard Method, SVMT25:D1332, for applying the "spray-test" in determining the water-repellency of fabrics. The conditions are identical with those of ASTM D583-40T (*ASTM Standards*, 1944, III, p. 1977). C—5C.

Fibre Roughness and Fabric Soiling. A. J. Hall. *Text. Merc.*, 1951, 125, No. 3249, pp. 67, 69, 71. The author discusses the effect of the roughness of fibres on the soiling properties of the fabric made from them. C—5C.

Wool Fabrics for Military Purposes: Functional Characteristics. F. H. Stoll. *Papers of the Amer. Assoc. Text. Technologists*, 1951, 6, 80-84. An interpretation of the requirements of characteristic military wool fabrics in terms of properties which can be evaluated by known laboratory methods, including protective properties, æsthetic appeal, colour fastness and camouflage characteristics, manufacture quality, dimensional stability, and wear resistance. W—5C.

Wool: Shrinkage: Testing. L. I. Weiner. ("Effect of Construction on Felting Shrinkage of Wool Knit Fabric.") *Knitted Outerwear Times*, 20/8/51, 19, (34), 7, 33. Discusses work that has been undertaken to determine the effect of such factors as wales and courses per inch and yarn size on the felting shrinkage of wool. Tables. H—5C.

(D)—Other Materials

Saran Films: Comparative Study of Water Vapor Permeability. Theodore W. Sarge. *Analyt. Chem.*, 1950, 22, No. 12, pp. 1541-1545. An examination has been made of several methods used for determining the water permeability of Saran films. Apparent discrepancies in the absolute values of water vapour transmission are considered to be due to over-all conditions, and to the time interval involved in making the determination. The specific application to which the film material is put should dictate the test method for rates of water vapour transmission. There are seven references. C—5D.

Starch for Specific Uses: Improved Methods for Evaluating. H. A. Campbell, F. Hollis, Jr., and R. V. MacAllister. *Food Technol.*, 1950, 4, pp. 492-496 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4472[e]). Procedures are outlined for evaluating starches for specific industrial processes. The flow characteristics of slurries of ungelatinised starch, changes occurring in the viscosity and microscopic appearance of starch slurries during heating, and the susceptibility of starches to amylase action at relatively low temperatures, were particularly useful in determining the manner in which different starches would react in food processing. C—5D.

An Instrument for Estimating the Moisture Content of Grain and Other Materials by the Measurement of Electrical Conductance. C. F. Brockelsby. *Cereal Chem.*, 1951, 28, No. 2, pp. 83-94. A fully portable instrument, which measures conductance in a circuit developed from the Wheatstone Bridge, has been designed for the estimation of the moisture content of grain and other granular, powdery and fibrous materials. The instrument is said to have several advantages over similar models, and to be accurate in the field in a moist climate even on freshly dried samples of grain and samples newly harvested in unfavourable weather. The instrument has also been calibrated for cotton, jute, wool,

rayons, chemical wood pulp, paper, cardboard, and cigarette tobacco. Some of these can be tested in the bale using "sword" electrodes. C—**5D.**

Bonded Units: Study. J. M. Buist, C. H. Lindsey, W. J. S. Naunton, R. L. Stafford and G. E. Williams. *Ind. Engng Chem.*, 1951, **43**, No. 2, pp. 373-381. An attempt has been made to establish a discriminating test for evaluating rubber-to-metal bonding agents, and a method has been evolved which discriminates between bonding agents hitherto regarded as equivalent. The volume of the rubber has been found to be of more importance than the shape. A tentative method for measuring the tear strength of the rubber used in the unit is put forward. There are seven references. C—**5D.**

Starches: Determination of the Granule Sizes. Erich Lindemann. *Die Stärke*, 1950, **2**, pp. 228-233 (through *Chem. Abstr.*, 1951, **45**, No. 2, p. 887ᶠ). Some methods for the determination of the granule sizes of starches are discussed. C—**5D.**

Dextrin: Production, Assay, and Quality Determination. Ottomar Wolff. *Die Stärke*, 1950, **2**, pp. 273-279 (through *Chem. Abstr.*, 1951, **45**, No. 9, 4069ᵉ). Three types each are suggested for both white and yellow dextrins. The classification for the former is based on its solubility in cold water, and for the latter on the viscosity of a 40 per cent. solution in water. C—**5D.**

PATENTS

Crayon for Marking Textile Materials. Uxbridge Worsted Co. Inc. B.P.653,841 of 30/5/1951. The method of manufacture is described of a durable, water-soluble crayon for marking cloth. It consists of a water-dispersible colour carrier, *e.g.* clay, fuller's earth or bentonite, a suitable dye, a potassium or sodium phosphate salt, and, if desired, a binder and a preservative. Water-soluble dyes, which are commercially available, and which are satisfactory in use, are listed. The crayon marks wool cloth clearly without glazing, the marks being readily removed during the usual wet processing. W.

6—DESIGN

(A)—TEXTILE DECORATION

Textile Design. Antony Hunt. London: Studio Publications, 1951, 96 pages. This book is one of the Studio's *How To Do It* series, and it deals with the subject from the point of view of the artist. It is mainly concerned with furnishing fabrics, and is extensively illustrated. (The original edition was published in 1937. The present edition has an entirely new text, and contains many illustrations of contemporary design.) C—**6A.**

7—LAUNDERING AND DRY-CLEANING

Detergent Power of Chemical Agents. Marc Ringeissen. *Teintex*, 1951, **16**, No. 5, pp. 219-226 (5 pages). In French. Details are given for testing the detergent (and cleansing) power of water-soluble chemical agents. The two principal methods are optical (comparison of "whites"), and gravimetric. Considerable attention is paid to application of "soil" mixtures to fabric so as to reproduce normal conditions. C—**7.**

Cationic Soaps: A New Color Reaction and Its Application to Studies of their Interactions with Cellulose Fibers. John A. Hart and Edward W. Lee. *Tappi*, 1951, **34**, pp. 77-79 (through *Chem. Abstr.*, 1951, **45**, No. 10, p. 4449ᶠ). The colour of an alkaline earth metal lake dispersion of Eriochrome Azural B (Colour Index 720; Geigy Co.) is very sensitive to the presence of cationic soaps, and was adapted to the colorimetric determination of these soaps. Details of preparation of the lake are given. One part in 10^7 of a surface-active quaternary ammonium salt could be detected by this method, and it was used to determine the adsorption of cetylethyldimethylammonium bromide on a number of wood pulp samples. C—**7.**

Soaps and Other Detergents. Anon. *A.S.T.M. Proceedings*, 1950, **50**, pp. 359-365. The report of committee D.12 includes as appendices proposed methods of test (1) for *pH* of aqueous solutions of soaps and detergents, and (2) for foaming properties of surface-active agents. C—**7.**

Investigation into the Usefulness of Four Fluorescent Bluings in the Washing of White and Coloured Fabrics. C. J. Seigers and K. J. Nieuwenhuis. *Mededel. Proefstat. Wasind.*, 1950, No. 73, 6 pages (through *Chem. Abstr.*, 1951, 45, No. 8, p. 3602°). Results are given of an investigation of the value of four types of fluorescent bluing agents (Uvitex RS, Uvitex RBS, Pontemine White BR, and Tinopal BV) in the usual Dutch laundering process for cotton, linen, and rayon, both white and coloured. C—7.

Detergency and Adsorption by the Fibre: Relationship. K. McLaren. *J. Soc. Dyers Col.*, 1950, 66, No. 10, pp. 521-529. In this study of the detergent properties of a substance and its adsorption at the fibre-solution interface, the authors have used a certain ethylene oxide condensate which has negligible detergent efficiency for wool under normal test conditions, but which can be rendered efficient, within limits, by the addition of acid, by increasing the temperature, and by increasing the concentration of sodium chloride. While increased adsorption was associated with increased detergency in the presence of acid, it was not associated with increased detergency when the temperature or the salt concentration were raised. It is therefore possible that efficient detergency does not require any greater adsorption by the fibre than occurs in wetting. C—7.

Non-Ionic Dry-Cleaning Detergents. G. E. Barker and H. J. Ranauto. *Soap*, 1951, 27, (6), 43-47, 57. Non-ionic dry cleaning detergents show excellent cleaning ability, high whiteness retention, no odour development, good emulsifying properties and economy in use. They are also good wet cleaning detergents, showing excellent detergency on many types of fabrics; are non-injurious to dyestuffs and useful in acid or salt solutions. La—7.

Non-Ionic Detergents. H. R. Suter and M. G. Kramer. *Soap*, 1951, 27, (8), 33-36, 149. Laboratory tests of non-ionic detergents with C.M.C. show that these mixtures are particularly suitable hard water detergents. Use of a solid non-ionic permits selection of a free-flowing organic detergent base which, when properly built with sodium tripolyphosphates and soda ash, gives detergency data comparing favourably with materials having proven efficiency in cotton detergency in either soft or hard water. La—7.

Cleaning Radio-active Contaminated Surfaces. D. H. Ross *Soap*, 1951, 27, (7), 30-32. Study of the surfaces best suited for use in laboratories handling radio-active materials and the properties of synthetic detergents which make them most suitable as cleaners. La—7.

Solvent-Detergent Products. A. Davidsohn. *Soap*, 1951, 27, (8), 47, 49, 149, Details of the preparation of various solvent-detergent products, including the combination of soap and alkyl aryl sulphonates and addition of solvents and/or non-ionic detergents to alkyl aryl sulphonates. La—7.

Built Synthetic Detergents. H. Stupel and A. Von Segesser. *Soap, Perfumery & Cosmetics*, 1951, 24, 558-565 (from *Soap*, 1951, 27, 79). Laboratory and practical washing tests show that a built heavy duty detergent of specified composition with a secondary alkyl sulphonate as the active organic material has greater detergent power than fatty acid soaps. Grease was more effectively removed with the built detergent, while albumin was removed more effectively with soap. La—7.

PATENTS

Detergents. F. J. Pollok and Imperial Chemical Industries Ltd. B.P.646,088 of 15/11/50. Soapless detergents which are oily liquids are prevented from separating from other constituents of a washing powder by the incorporation of C.M.C. with the liquid oily detergent. La.

Detergents. Imperial Chemical Industries Ltd., F. J. Pollok and W. A. Caldwell. B.P.650,222 of 21/2/51. Anionic detergents may be stabilised at a higher viscosity by the incorporation of C.M.C. if the concentration of the detergent is not above 8 per cent. and if that of the C.M.C. is not less than 2 per cent. of the weight of the composition. The C.M.C. should be in the form of a water soluble alkali metal salt, the degree of substitution should be at least 0·55 carboxymethyl groups per anhydro-glucose unit of the cellulose and the viscosity of a 1 per cent. solution should be at least 100 centistokes at 20° C. La.

Fur and Pile Fabrics: Machine for Processing. R. S. Schaab and J. E. Tiso. U.S.P.2,552,593 of 15/5/1951. A machine is described for ironing articles of clothing made from fur or pile fabrics, particularly mouton coats. The procedure is claimed to renovate the fur or pile without damage to the garment, and to require the attention of only one operator. W.

8—BUILDING AND ENGINEERING

(A)—Construction and Maintenance of Buildings and Plant

Corrosion. Mars G. Fontana. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 73A-74A. This paper reviews work done on the susceptibility of austenitic 18-8 stainless steels to intergranular corrosion, reported by E. M. Mahla and N. A. Nielsen in a paper entitled "Carbide Precipitation in Type 304 Stainless Steel—An Electron Microscope Study". It is concluded that the carbide particles form and undergo transformation at sensitising temperatures as follows: precipitation of dendrites →fragmentation of dendrites→change to more stable geometric forms. Cold work after sensitisation is said to restore corrosion resistance. C—8A.

Sodium Silicate: Rôle in Inhibiting Corrosion by Film Formation on Water Piping. Leo Lehrman and Henry L. Shuldener. *J. Am. Water Works Assoc.*, 1951, 43, pp. 175-88 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4381[E]). The formation of the so-called "self-healing" film is studied. The procedure is carefully described. Several different silica compounds were used. Silica is removed from solution, but not until solid corrosion products form. The film produced is found to be predominantly amorphous silica. The mechanism of removal is largely adsorption. C—8A.

Industrial Processes: Regulation. H. J. Roosdorp. *Philips Tech. Rev.*, 1951, 12, No. 8, pp. 221-227. This is an introductory article of a general nature on regulating systems for industrial processes. In designing a regulating device, the most important factors are considered to be the offset and the dynamic inaccuracy, and the stability and the damping. The author discusses the advantages of using an electrical model of the process to be regulated and the controller to be designed; the operation can be observed with an oscilloscope. Controllers are classified as discontinuously and continuously acting controllers. In the latter, a proportional, an integral and a derivative action can be introduced in different ratios. C—8A.

Textilmaschinen. P. Beckers. Berlin: Cram, 1950, viii+439 pages. In German. This is a comprehensive work on textile machinery, and covers spinning, weaving, finishing, and air conditioning. The emphasis is on construction. (The patent rights mentioned in the book are no longer valid under present conditions in Germany. Many of the firms named, particularly in the Eastern Zone, have ceased to exist, or have changed their names.) C—8A.

A Bibliographical Survey of the Development and Use of Substitute Materials for Non-Ferrous Metals and Alloy Steels in Germany. London: H.M.S.O., 1951, 46 pages. This survey, RMS-2, consists of short summaries of B.I.O.S., C.I.O.S., and F.I.A.T. reports, and of untranslated German documents. C—8A.

(C)—Steam Raising and Power Supply

Fireside Deposits on Steam Generators Minimised through Humidification of Combustion Air. P. Murphy, Jr., J. D. Piper and C. R. Schmansky. *A.S.M.E.*, 1950, Paper No. 50-A-86 (through *J. Brit. Shipbldg R.A.*, 1951, 6, No. 2, p. 81). Fireside deposits in stoker-fired steam generators at the Delray Plant of the Detroit Edison Company have been greatly reduced by increasing the humidity of the combustion air to at least 16 lb. of water per 1,000 lb. of dry air. Humidification is thought to improve the average steam-generator efficiency enough to compensate thermally for the water used. Tests indicate that the extent of fouling of heating surfaces is an inverse function of the amount of water in the combustion air, at least up to 25 lb. of water per 1,000 lb. of dry air. Humidification appears to have the effect of decreasing volatilisation from the fuel bed. particularly of silicon compounds. C—8C.

Fly Ash Erosion in Boiler Plants. V. Walker. *Cheap Steam*, 1950, 34, November, p. 147 (through *J. Brit. Shipbldg R.A.*, 1951, 6, No. 2, p. 82). The rate of erosion by fly ash in boiler plants is discussed, together with steps taken

to eliminate erosion of boiler parts. New designs of fan wheels, and the installation of a dust collector in front of the fan, minimise erosion of the induced-draught fans in modern boilers. C—**8C.**

Electrification of Worsted Mills in the Midlands. J. C. Edmed and J. E. Cole. *Text. Merc.*, 1951, **125**, 492-494. Problems experienced in the conversion from steam to electric power are discussed. These include tests for the selection of motors best suited to each machine, the positioning of individual motors, change-over without loss of production, and the sectionalisation of motor circuits to minimise possibility of a stoppage in production in case of breakdown. The advantages gained by the change are briefly considered. W—**8C.**

(D)—Power Transmission

The Oiling of Small Mechanisms. P. C. Smethurst. *J. Sci. Instrum.*, 1951, **28**, No. 1, p. 30. A small hypodermic syringe of 1 c.c. capacity, with a long needle fitted to its nozzle, has been used successfully in the oiling of small mechanisms where small numbers of oil-drops must be accurately placed. The needle point was either turned over or filed off. C—**8D.**

Synthetic Lubricating Oils—a Symposium. American Chemical Society (Division of Petroleum Chemistry). *Ind. Engng Chem.*, 1950, **42**, No. 12, p. 2414. In his introduction to the symposium, Mr. B. H. Shoemaker makes remarks of a general nature on the new synthetic lubricants—the silicones, fluorocarbons and chlorofluorocarbons—and on their possible commercial future. The symposium includes the following papers: Structural Guides for Synthetic Lubricant Development, by C. M. Murphy and W. A. Zisman; Functional Selection of Synthetic Lubricants by R. G. Larsen and A. Bondi; Review of German Synthetic Lubricants by William A. Horne; Polyalkylene Glycol Synthetic Lubricants by W. H. Millett; Polymeric Additives for Synthetic Ester Lubricants by F. J. Glavis; Noncatalytic Polymerisation of Olefins to Lubricating Oils by F. M. Seger, H. G. Doherty and A. N. Sachanen; Boundary Lubricating Characteristic of Organopolysiloxanes by C. C. Currie and M. C. Hommell; Flow Characteristics of Organopolysiloxane Fluids and Greases by C. C. Currie and B. F. Smith; and Thermal and Oxidation Stability of Polymethylphenylsiloxanes by C. M. Murphy, C. E. Saunders and D. C. Smith. C—**8D.**

The Limitations of Mechanical Power Drives. W. Thomas. *Z. ver. dtsch. Ing.*, 1950, **92**, November, p. 902. In German. (Through *J. Brit. Shipbldg R.A.*, 1951, **6**, No. 2, p. 85). Eight types of power drive—rope, belt, V-belt, steel band, chain, friction wheel, toothed gear, and worm and worm wheel—are compared from the point of view of weight, price, maximum power transmissible, circumferential speed, velocity ratio, and efficiency. Toothed-gear drives find the greatest practical application, but the author regards it as important that each actual case should be treated on its merits, and the drive employed chosen to suit the conditions to be met. C—**8D.**

(E)—Transport

Handling of Material. Robert E. Wright. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 93A-94A. The usefulness of the fork-lift truck in the handling of industrial materials is described, with illustrations and photographs of the application of the palletless method of handling to various transport operations. C—**8E.**

(F)—Lighting

Lamp Fittings: Permissible Brightness. D. Vermeulen and J. B. De Boer. *Philips Tech. Rev.*, 1951, **12**, No. 7, pp. 200-206. An investigation has been carried out to discover the maximum brightness of lamp fittings in a room which will still be "comfortable" to a person sitting in the room. The tests were performed with a square and an elongated source of light, but owing to the many factors involved the results pointed only to the need of more extensive experiments in the field of "brightness engineering". C—**8F.**

(G)—Heating, Ventilation and Humidification

Atmospheric Pollution. Louis C. McCabe. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 85A-86A. Details are given of available equipment, methods and literature which may prove helpful to laboratories starting to work on atmospheric pollution problems. C—**8G.**

Ramluftfrage in der Industrie. Otto Oldenhage. München: Oldenbourg, 1951, 66 pages. In German. This monograph on air conditioning in textile mills contains chapters on physical measurements of air; methods and apparatus; air currents; humidity; various methods of air conditioning and their advantages and disadvantages; and costing. C—8G.

(H)—Water Purification

Aquatic Weed Control with Sodium Arsenite. K. M. Mackenthum. *Sewage and Industr. Wastes*, 1950, **22**, pp. 1062-1067 (through *Brit. Abstr.*, 1950, B III, July, p. 300). The author describes the use and method of application of a solution of commercial sodium arsenite which has proved successful in destroying weeds in lakes in Wisconsin. There appear to be no harmful effects on fish life. Eradication takes about seven days, after which the weeds sink and remain in the bottom muds. Weeds destroyed include arrowhead, water plantain, bladderwort, coontail, waterweed, wild celery, pondweeds, water crowfoot, and water milfoil, whilst water lilies and bulrushes are resistant to moderate amounts of the chemical. *Chara* are very resistant, but can be destroyed by copper sulphate. C—8H.

(I)—Waste Disposal

Sewage- and Waste-Treatment and Water Pollution: Critical Review of Literature of 1949. W. Rudolfs *et al.* *Sewage and Industr. Wastes*, 1950, **22**, pp. 593-653 (through *Brit. Abstr.*, 1950, B III, November, p. 472). A critical survey is given of progress during 1949 in analytical methods; sedimentation of sewage; treatment by activated sludge and biological filtration; chlorination; digestion, disposal, and utilisation of sludge; effects of synthetic detergents on sewage-treatment; mechanical equipment; industrial waste-treatment; and problems of water pollution. There are three hundred and ninety-eight references. C—8I.

Dye House Wastes: Developments in Treatment. S. O. Zack. *Sewage Wks Engng*, 1949, **20**, pp. 129-130 and 172-173 (through *Water Poll. Abstr.*, 1950, **23**, No. 1, p. 20). A mill for weaving, dyeing and bleaching cotton, rayon, nylon and other fibres has recently been constructed at Dallas, Pa (U.S.A.). Waste waters from the plant consist of spent solutions from scouring, sizing and dyeing, and bleaching and rinse water; the volumes of waste water produced vary considerably. To conform to State regulations it was necessary to construct a plant for treating the effluents before the mill began to operate. Data on the character and volume of waste waters at a similar mill were used for determining the most satisfactory type of treatment and design of plant. Experiments showed that to produce a satisfactory effluent, treatment would have to comprise coagulation and sedimentation followed by a biological process. The most satisfactory coagulant was found to be a mixture of copperas with lime, although when black dye washes were not present, calcium chloride was efficient. As the waste waters were not available for experiment, it was decided to construct plant for coagulation and sedimentation, but to postpone construction of secondary treatment units. Effluent from the sedimentation tanks is discharged to a pond, the contents of which are aerated by spraying. Results of the operation of the plant show reductions in content of suspended solids from 207 parts per million to 18 p.p.m., and in B.O.D. (biological oxygen demand) from 697 p.p.m. to 53 p.p.m. The possibility of dewatering the sludge on vacuum filters is being investigated. C—8I.

Synthetic Detergents: Further Experiments at Huddersfield, particularly with respect to their Action on Percolating Beds. H. H. Goldthorpe and J. Nixon. *J.R. Sanit. Inst.*, 1950, **70**, pp. 116-130 (through *Water Poll. Abstr.*, 1950, **23**, No. 1, p. 13). The experiment described shows that when sewage contains Lissapol N (I.C.I.) or Teepol X (Shell), percolating filters may remain unaffected for months, but that in the course of time they become badly choked compared with filters treating sewage which does not contain detergents of those types. C—8I.

Industrial Waste Treatment: Unique Flotation Unit. F. S. Gibbs. *Water & Sewage Works*, 1950, **97**, 241-245. A description of the evolution, in America, of a plant for clarifying industrial wastes by a flotation method. The specific gravity of the suspension particle is reduced to less than the specific gravity of the liquid vehicle by controlling the size of gas bubbles. The suspensions are

removed as a floating sludge. The application of the plant to wool scouring wastes and to soap wastes is described. W—8I.

Wool Grease: Recovery and Uses, and the Regeneration of Scouring Liquors. See Section 4B. W—8I.

Scouring and Grease Recovery: A New Method for Raw Wool. See Section 4B. W—8I.

Lanolin: Preparation from Wash Water of Wool. N. Haidee. *Mon. farm. y terap.* (*Madrid*), 1951, 57, 177-178 (through *Chem. Abstr.*, 1951, 45, 6859). The soap present is decomposed with sulphuric acid while air is blown through the liquid. Fatty acids and lanolin rise to the surface while dirt containing some fat settles to the bottom, leaving a clear liquid. The aqueous medial layer is siphoned off, the solids are dried and extracted with benzene, the solution is washed with alcoholic potash, and the benzene is distilled off. As an alternative method, centrifugation between 45° and 75° and a *pH* below 8 is described. The crude fat is freed of acids with alcoholic potash, bleached with oxidants, and deodorised with superheated steam. W—8I.

PATENT

Stabiliser for Trailer Bogies. Oyler Motor Transit Co., and George D. Harrah. U.S.P.2,552,483: Appl. and filing 18/5/1948; Publ. 8/5/1951. C.

9—SCIENCE

Empoasca lybica De Berg: Control on Cotton in the Anglo-Egyptian Sudan. J. W. Cowland and C. J. Edwards. *Bull. ent. Res.*, 1949, 40, pp. 83-96; *Minist. Agric. Sudan, Mem. Res. Div.*, 1949, No. 6, 14 pp. (through *Brit. Abstr.*, 1950, B III, November, p. 451). The life cycle of *Empoasca lybica* and symptoms of its damage on cotton are given. In laboratory tests DDT emulsions gave excellent initial kills, with good residual effect, whilst Gammexane emulsions were slightly less effective. In the field, 0·1 per cent. and 0·05 per cent. DDT emulsions were effective against jassids for two to three weeks. Very young plants were injured by DDT sprays, but emulsions containing up to 0·5 per cent. DDT were used with safety on two months old plants. C—9.

Cellulose Fibrils in the Cell Wall of Growing Cotton: Orientation and Its Bearing on the Physiology of Cell Wall Growth. P. A. Roelofsen. *Biochim. Biophys. Acta*, 1951, 7, No. 1, pp. 43-53. Under certain conditions, young cotton hairs viewed between crossed nicols falsely create the impression that transverse and spiral structures are present. This is caused by wrinkles in the shrunken cell wall, which are not in fact oriented in spirals. The extinction angle of the birefringence, in pieces of single cell wall protruding from cut ends of disintegrated young cotton hairs, proves that the average fibril direction is either transverse or follows a very flat spiral. Differences in inner and outer layer structures of the primary cell wall are shown on electron micrographs, and an explanation is offered. Some very clear electron micrographs are included. C—9.

Termite Repellents. G. N. Walcott. *Sugar*, 1949, 44, No. 12, pp. 56-58 (through *Brit. Abstr.*, 1950, B I, November, p. 960). Wood impregnated with 0·15 per cent. of copper (as copper sulphate) remained immune to attack by *Cryptotermes brevis*, Walker, for over four years; 0·2 per cent. zinc chloride was equally effective. Ferric chloride was as repellent as zinc chloride, but ferrous compounds were valueless. Cadmium bromide and cadmium acetate were more repellent than copper sulphate. Several non-volatile mercury compounds were more repellent than copper sulphate. The fluoride compounds of calcium, lithium, sodium and potassium at concentrations of 2 per cent. of fluoride were repellent. Copper fluoride was ten times as repellent as copper sulphate, and zinc fluoride ten times as repellent as zinc chloride. C—9.

Insect Populations in the Field: Changes in Relation to Preceding Weather Conditions. C. B. Williams. *Proc. Roy. Soc.*, 1951, Series B, 138, February, pp. 130-156. An attempt has been made to measure changes in a mixed insect population under natural conditions in the field, and to see to what extent they are quantitatively related to such factors as rainfall and minimum temperature in the three previous months. C—9.

Microbiology: Evolution. Sir Paul Fildes. *Proc. Roy. Soc.*, 1951, Series B, 138, February, pp. 65-74. In this Leeuwenhoek lecture the evolution of the new field of microbiology, which links several fields of biology (such as bacteriology, protozoology, *etc.*), is traced from the original work of Leeuwenhoek, who studied microscopic organisms in the seventeenth century, through the theory of spontaneous generation, and the discovery of fermentation by micro-organisms and of disease-causing germs, to the recently discovered viruses. C—9.

Growing Micro-organisms: New Techniques for Study. T. W. Pearce and E. O. Powell. *J. Gen. Microbiol.*, 1951, 5, No. 1, pp. 91-103. A method is described for the examination of growing micro-organisms by vertical and oblique incident illumination, using an illuminator of the "Universal Illuminator" type. A moist chamber has been developed to enable this method to be used for the routine examination of bacterial cultures, and examples are given of both aerobic and anaerobic cultures on the surface of solid nutrient media (preferably containing nigrosine). This method has also been used for following spore germination in a liquid medium. A method using Cellophane as a support for growth is also described. Certain organisms can be grown on Cellophane "windows", made in the caps of Bijou bottles containing a liquid medium; this apparatus is found to be suitable for the repeated, but not continuous, examination of young growths. C—9.

Giant Colonies: Photographic Examination. Dora Kulka, J. M. Preston and T. K. Walker. *J. Gen. Microbiol.*, 1951, 5, No. 1, pp. 18-21. An apparatus has been designed to photograph colonies of micro-organisms on Petri dishes under conditions either of dark-field illumination or of top-lighting. It serves to reveal any motility of the organisms, and is said to be a valuable aid in identification. C—9.

A Crystalline Decomposition Product of Starch by a Bacillus. Shichiro Akiya and Tadao Watanabe. *J. Pharm. Soc. Japan*, 1950, 70, p. 572-576 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4471[e]). A new strain of acetone-ethyl-alcohol-fermenting bacteria which has characteristics similar to those of *B. macerans*, and which gives a crystalline dextrin from potato gruel, has been isolated. The new dextrin is found to be a hexasaccharide and, when methylated, is found to be an oligosaccharide in which six molecules of 2,3,6-trimethylglucopyranose are bound in a ring form. The new dextrin is decomposed by maltase and β-amylase to give glucose and maltose, and has both α- and β-linkages. Schardinger's dextrin is decomposed by maltase only and has only α-linkage. C—9.

Basic Amino-Acid Contents of Collagen and of Deaminised Collagen. T. P. Salo. *Arch. Biochem.*, 1949, 24, pp. 25-30 (through *Brit. Abstr.*, 1950, A II, July, p. 796). The total basic amino-acid content of various types of mammalian collagen is found not to vary significantly, although the ratios of individual basic amino-acids do. Deamination results in a loss of 41 per cent. of the total basic amino-acid content. C—9.

The Deamination of Crystalline Egg Albumin. I. Preparation and Properties of Various Soluble and Denatured Derivatives. Paul H. Maurer and Michael Heidelberger. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 2070-2072. The removal of 27 to 36 per cent. of amino groups from crystalline egg albumin under mild conditions led to a soluble deaminated egg albumin. At the same time a denatured derivative was formed and its deamination was greater than that of the soluble fraction. Upon further deamination the soluble egg albumin becomes insoluble at its isoelectric point, indicating that removal of this portion of the free $-NH_2$ groups which may participate in holding the native molecule in corpuscular form, leads to partial unfolding of the molecule. Complete deamination was not achieved. There are thirty-three references. (See also the two following abstracts.) C—9.

The Deamination of Crystalline Egg Albumin. II. Physical and Chemical Properties of the Soluble and Denatured Derivatives. Paul H. Maurer, Michael Heidelberger and Dan H. Moore. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 2072-2076. The partially deaminated (27 to 36 per cent.) and soluble derivative of egg albumin, reported in the previous paper, has physical and chemical properties like those of native egg albumin and is termed undenatured deaminated egg albumin. The insoluble derivative formed during deamination (33-56 per cent.) of egg albumin has many properties characteristic of the

denatured state, but its configuration appears to be less extended than that of the acid-denatured egg albumin, as indicated by several tests of denaturation. This less completely unfolded protein is relatively stable to further treatment with acid at *pH* 1·5, whereas the undenatured deaminated egg albumin is readily transformed into an acid-denatured egg albumin derivative different from the one obtained by deaminating acid-denatured egg albumin. There are thirty-seven references. (See also preceding and following abstracts.) C—9.

The Deamination of Crystalline Egg Albumin. III. Quantitative Immunochemical Studies on Crystalline Egg Albumin and its Denatured and Deaminated Derivatives. Paul H. Maurer and Michael Heidelberger. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 2076-2080. The serological specificity of egg albumin is not influenced by the removal of about one-third of the free $-NH_2$ groups when the protein remains undenatured. In the denatured form, which shows a specificity different from that of egg albumin, removal of up to *ca.* 60 per cent. of $-NH_2$ from denatured egg albumin, or from the insoluble derivative formed during deamination, resulted in a scarcely significant decrease in the nitrogen precipitated from their homologous antisera. Changes in immunological specificity of any of the fractions due to physical aggregation or change of $-S-S-$ to $-SH$ linkages are relatively minor. The quantitative immunochemical data supplement information gained by parallel chemical and physical studies of egg albumin and its deaminated and denatured derivatives, and lead to the conclusion that the products described have definite form and structure. There are sixteen references. (See also two previous abstracts.) C—9.

Malt Amylases and their Action on Starch. Muntona Ltd. and Edward Fison Ltd. *Monographs on Malt and Malt Products*, 1951, 18 pages. This pamphlet describes the hydrolysis of starch by enzymes, discusses the factors affecting malt amylase activity (temperature, hydrogen ion concentration, enzyme concentration, time of reaction, type of substrate, presence of other substances), and reviews the methods of estimating amylase activity. There are fourteen references. C—9.

Amino-Polysaccharides. III. Constitution of Hyaluronic Acid. Kurt H. Meyer, J. Fellig and Ed. H. Fischer. *Helv. chim. Acta*, 1951, 34, No. 3, pp. 939-951. In French. An examination has been made of hyaluronic acid obtained from the human umbilical cord and purified by fractional precipitation. It appears that the free aldehyde group belongs to a glucuronic residue. Reductiometric experiments indicate a degree of polymerisation of 56. The high viscosity of solutions of hyaluronic acid cannot be ascribed to the presence of proteins; this viscosity is considerably reduced in the presence of salts. The structure of the acid is discussed. C—9.

Amylolytic Enzymes. XVI. Purification and Crystallisation of β-Amylase from Malt. Kurt H. Meyer, Ed. H. Fischer, and A. Piguet. *Helv. chim. Acta*, 1951, 34, No. 1, pp. 316-324. In French. A method is described for obtaining a purified crystalline β-amylase from commercial malt extract. After destroying the α-amylase in an acid medium, and after eliminating the sugars and polysaccharides by precipitation with ammonium sulphate, the β-amylase is purified by fractionating with acetone. Crystallisation of the enzyme followed upon a fifteen-fold concentration, a yield of 450 mg per kilogram of malt extract being obtained. C—9.

Amylolytic Enzymes. XVII. Contribution to the Study of α-Amylase Obtained from Malt. Ed. H. Fischer and C. H. Haselbach. *Helv. chim. Acta*, 1951, 34, No. 1, pp. 325-334. In French. The paper discusses the properties of malt α-amylase. In spite of deactivation by specific organic chloro-mercurial compounds containing $-SH$ groups, the α-amylase does not contain sulphur. In this, it resembles α-amylases of animal origin. On the other hand, a clear distinction from these latter enzymes can be based on (1) the fact that the optimum activity of the malt enzyme lies between *pH* 4·7 and 5·4, its iso-electric point being at *pH* 5·7, and (2) the incidence of very great solubility in water at *pH* 7. Further, its activity in terms of weight units is very much lower than that of the animal enzymes. The calcium ion is indispensable for malt α-amylase activity. C—9.

Annual Review of Biochemistry, Volume 20. J. Murray Luck (Editor). Stanford (U.S.A.): Annual Reviews Inc., 1951, x+648 pages. The present

volume contains reviews of the literature for 1950, some of which are referred to elsewhere in these abstracts. C—9.

Crystallisation of Fibroin. S. N. Beketovsky. *Tekstil. Prom.*, 1950, **10**, May, p. 35 (through *J. Soc. Dyers Col.*, 1950, **66**, No. 10, p. 563). After filtration and dialysis, fibroin is found to crystallise out in small needles from a solution of degummed silk, dispersed at a concentration of 100 g. per litre in a 40 per cent. solution of lithium nitrate at the boil. C—9.

Deformation of Proteins of the Keratin-Myosin Group in Solutions of Organic Substances. A. G. Pasynskii and V. Blokhina. *Dokhlady Akad. Nauk S.S.S.R.*, 1950, **73**, pp. 535-538 (through *Chem. Abstr.*, 1951, **45**, No. 2, p.684[e]). The authors examined the tensile characteristics of wool and hair keratins, and of muscle protein, using various solutions for immersion. For the wool and hair keratins, the area of the hysteresis loop and the work of extension in the following solutions were measured: water, acetate buffer, urea, guanidine nitrate, urethane, Sulfanol, Igepon, and sodium hydrosulphite. All but one (sodium hydrosulphite) of the solutions tested reduced the work of extension and decreased the area of the hysteresis loop. C—9.

Proteins: Effect of Heating on Structure and Properties. I. Collagen. A. L. Zaĭdes. *Kolloid Zhur.*, 1950, **12**, pp. 347-351 (through *Chem. Abstr.*, 1951, **45**, No. 2, p. 889[a]). The effects of heating on the following properties of collagen have been examined: the crystal X-ray spacing, absorption of water vapour, tensile strength, and acid combining capacity. The results obtained indicate that heating ruptures the main valency chain and produces new links between the chains. C—9.

Sericin of Raw Silk: Fixation. VIII. Ageing Phenomena of Sericin-Fixed Cocoon Fibers. Masami Oku, Tsuneo Kurasawa, and Hitoshi Fujimoto. *J. Agr. Chem. Soc. Japan*, 1942, **18**, pp. 1065-1069 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5412[e]). The sericin of raw silk, fixed in three different ways (by formaldehyde gas, by basic chromium chloride and by chromium-alum), was heated over a period, and the change in its solubility tested. The effect of ultra-violet radiation on the fixation was also studied. There was evidence to suggest that colloidal particles of $(Cr_2O_3)_n$ became bridges of sericin polypeptide linkages. C—9.

Sericin of Raw Silk: Fixation. IX. The Effect of Finishing Chemicals upon Fixing Degrees. Masami Oku and Tsuneo Kurasawa. *J. Agr. Chem. Soc. Japan*, 1942, **18**, pp. 1070-1072 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5412[g]). Anion-active finishing agents such as "pan-softer", Turkey red oil, and oleic acid emulsion gave a better degree of fixation of sericin by formaldehyde or chromium salts, when the finishing agents were applied prior to fixation. This effect is considered to be due to the intensified combination of cation-active fixing agent with the treated fibres. C—9.

Sericin of Raw Silk: Fixation. X. The Relation of Fixation with the Ratio of Adhesion of Fibroin Fibers. Masami Oku, Tsuneo Kurasawa, and Hitoshi Fujimoto. *J. Agr. Chem. Soc. Japan*, 1943, **19**, pp. 7-8 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5412[g]). Non-fixed cocoon fibres showed 72 per cent. of adhesion ratio (of pairs of fibroin fibres) after carding, while sericin-fixed ones showed more than 90 per cent. of adhesion ratio. C—9.

Sericin of Raw Silk: Fixation. XI. Fixation by Urea Resin. Masami Oku and Ikuzô Sakaguchi. *J. Agr. Chem. Soc. Japan*, 1943, **19**, pp. 235-237 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5412[h]). In sericin-fixation the molecular ratio of 1 : 2 urea and formaldehyde was found to be best. The concentration of the fixation liquor was found to have only a small effect on the degree of fixation. Optimum temperature and time for the baking process are given. C—9.

Sericin of Raw Silk: Fixation. XII. The Amount of Formaldehyde Combined with Sericin. Masami Oku and Sumio Hakoyama. *J. Agr. Chem. Soc. Japan*, 1948, **22**, p. 38 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5412[i]). The amount of formaldehyde which combined with sericin was determined, separately, as that which combined by sorption and that which combined chemically. The effect of ammonia, hydrochloric acid and sulphuric acid on the combination was investigated. β-sericin was found to absorb more formaldehyde than α-sericin. C—9.

Proteins: Hydrolysis for Liberation of Eighteen Amino Acids. Ugo Mondolfo and Vittorio Cambon. *Boll. Ist. Sieroterap. Milan*, 1950, **29**, pp. 148-160 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9999^{g}). A study was made of acid hydrolysis and enzymic hydrolysis of proteins. A comparison was made between enzymic hydrolysis using pancreatin and activated erepsin, and acid hydrolysis using 3 N hydrochloric acid, for isoleucine, histidine, leucine, valine, phenylalanine, lysine, methionine, serine, tyrosine and threonine. C—**9.**

Nonoxidative, Nonproteolytic Enzymes. W. R. Frisell and Leslie Hellerman. *Annual Review of Biochemistry*, 1951, **20**, pp. 23-42. This is a review of the literature for 1950. There are two hundred and twenty-seven references. C—**9.**

Silk Fibroin: Polydispersity. R Signer and R. Glanzmann. *Makromol. Chem.*, 1951, **5**, No. 3, pp. 257-261. In German. Fractionation precipitation proves that degummed silk is highly polydisperse. So far, experiments to devise a method for degumming silk without causing some degradation have been unsuccessful. Fibroin molecules are quickly degraded in cupri-ethylenediamine. C—**9.**

Starch: Research. 49. Determination of the Products of the Enzyme. Hydrolysis of Starch. Kurt H. Meyer and W. F. Gonon. *Helv. chim. Acta*, 1951, **34**, No. 1, pp. 290-294. In French. Specific yeasts are used to determine glucose, maltose and residual dextrins produced during the decomposition of starch by α-amylase. *Candida monosa* ferments yeast only, whereas *Saccharomyces Chodati* ferments both glucose and maltose. *Iso*maltose is attacked very much more slowly, whilst maltotriose and the oligosaccharides remain unaffected. C—**9.**

Starch: Research. 50. Decomposition of Amylose by α-Amylases. Kurt H. Meyer and W. F. Gonon. *Helv. chim. Acta*, 1951, **34**, No. 1, pp. 294-307. In French. A study has been made of the progress of decomposition of amyloses obtained from potato and maize starches by α-amylases crystallized from pig pancreas and malt; the degrees of polymerisation of the amyloses were 72 and 250 respectively. Decomposition curves show that ageing has a considerable retarding influence on the action, this effect being more pronounced when the concentration of enzyme is low and when the degree of polymerisation is high. The amylases have a much lower affinity for the dextrins and the oligosaccharides than for the intact substrate and the initial decomposition products. These differences are very pronounced in the case of the malt amylase. When the enzyme is in great excess, the decomposition curve approaches that of a monomolecular reaction. The effects of ageing, and decreasing affinity, are superposed during the decomposition. The fact that maltose is not attacked by the amylases, and that it is a non-competitive inhibitor, can be explained by assuming an enzyme-substrate fixation different from that of either amylose or dextrin. The products at different stages of hydrolysis are identified by methods described in the previous paper (see preceding abstract). Whichever α-amylase was used, the end products were 13 per cent. glucose and 87 per cent. maltose; this supports the theory propounded earlier (see *J. Textile Institute*, 1942, **33**, A284), that the enzyme can break, with equal ease, all the glucoside bonds in long-chains with the exception of the terminal bonds; larger fragments are therefore degraded more rapidly than the smaller ones, so that maltotriose is decomposed only very slowly to glucose and maltose. A mathematical expression of this theory is presented. C—**9.**

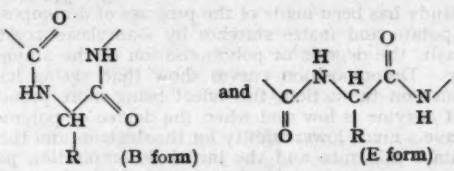
Starch: Research. 51. Degradation of Amylopectin by α-Amylases. Kurt H. Meyer and W. F. Gonon. *Helv. chim. Acta*, 1951, **34**, No. 1, pp. 308-316. In French. α-Amylases crystallised from pig pancreas and from malt were used in the study of the amylolytic degradation of amylopectins obtained from potato and maize starches. The degrees of polymerisation of the amylopectins were 1,100 and 280 respectively. Amylopectin degradation proceeds more slowly than that of amylose. Though ageing and substrate-enzyme affinity affect the course of the hydrolysis, the former is of much less importance than it is in the case of the amyloses; flattening of the decomposition curve is therefore due to weak affinity of the amylases for the dextrins. The final decomposition products of an amylopectin including about 4 per cent. terminal groups, consist of about 19 per cent. glucose, 73 per cent. maltose and 8 per cent. isomaltose. The 1-6 bonds are not broken by α-amylases. During the decomposition of a starch solution, the

phenomena observed in the cases of amylopectin and amylose are superposed. The decomposition of starch pastes is complicated by the presence of undissolved grains. C—9.

Sorption of Molecules of Nonelectrolytes by Proteins. A. G. Pasynskiĭ and R. S. Chernyak. *Doklady Akad. Nauk S.S.S.R.*, 1950, 73, pp. 771-774 (through *Chem. Abstr.*, 1951, 45, No. 2, p. 685[a]). The technique of equilibrium dialysis through a collodion membrane was used to study the sorption of urea, guanidine nitrate, urethane, and water on human serum albumin, γ-globulin, and hair and wool keratins, at 3-4° C. The results, given graphically, have the form of typical Langmuir isotherms with a clear zone of saturation. C—9.

Protein: Structural Chemistry. I. Takehiko Shimanouchi and San'ichirô Mizushima. *Science* (Japan), 1947, 17, pp. 24-26 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2521[d]). There are three points of potential minimum in the intramolecular rotation around the C–C axis. A substance of the general formula XH_2C-CH_2Y has one trans form (T) and two intermediate forms (G), the latter being obtained by a 120° rotation about the C–C axis. New structural models have been obtained for α- and β-keratin by applying the above considerations to polypeptide chains. In the model of α-keratin, the main chains consist of successive G configurations with side chains attached in the T configuration. The model of β-keratin has the main chains of successive G form and side chains are attached in the G form. By means of these models the experimental results obtained by X-ray diffraction can be fully explained. The mechanical properties of wool are discussed on the basis of these structures. C—9.

Proteins: Structural Chemistry. II. Takehiko Shimanouchi and San'ichirô Mizushima. *Science* (Japan), 1947, 17, pp. 52-53 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2521[e]). For the structure of amino acid residues two elementary forms, B and E, are possible:



Using these symbols, α- and β-keratin can be expressed by BBB . . . and EEE . . . , respectively. Models for other proteins can be built up in a similar way. Denaturation is explained by the small energy difference between the B and E forms, which permits molecular structures to be changed easily. C—9.

Proteins: Structural Chemistry. III. The Structure of Proteins and the Phenomena in Living Bodies. San'ichirô Mizushima and Takehiko Shimanouchi. *Science* (Japan), 1948, 18, pp. 452-453 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2522[b]). The great multiplicity of the E and B forms (see previous abstract) in polypeptide chains is taken to explain the multiplicity of antibodies and the specificity of enzymes. The denaturation of proteins by ultrashort waves is also explained. C—9.

Silk Fibroin: Structure. Yasuo Tazawa. *Acta Phytochim.* (Japan), 1942, 13, pp. 57-83 (in German) (through *Chem. Abstr.*, 1951, 45, No. 7, p. 3159[i]). Experimental evidence is adduced to show that silk fibroin under the action of waterfree glycerol, ethylene glycol, tetrahydro-naphthalene, or decahydro-naphthalene, is depolymerized to diketo-piperazines which are only slightly hydrolysed when subsequently treated with 38 per cent. hydrochloric acid or 70 per cent. sulphuric acid at 30° C. for 24 hours, although amido side groups may be split off in some cases. C—9.

Plasticisers obtained from Polyvinyl Chloride Compositions: Analytical Examination. Part I. Chemical Examination of Plasticisers. J. Haslam and W. Soppet. *J. Appl. Chem.*, 1951, 1, March, pp. 112-119. Methods which have proved useful in the chemical examination of plasticisers used in polyvinyl chloride (PVC) compositions, are summarized. Information is given about the method of isolation of the plasticiser and the qualitative tests which may be applied. On the quantitative side attention is given to the saponification value and the determination of phthalate, phosphate and chlorine. Methods which

have proved useful in the isolation of the alcohols derived from ester-type plasticisers are described. C—9.

Plasticisers obtained from Polyvinyl Chloride Compositions: Analytical Examination. Part II. Infra-Red Examination of Plasticisers. H. A. Willis. *J. Appl. Chem.*, 1951, 1, March, pp. 119-124. The infra-red spectra of 19 common plasticisers are presented, and the use of these spectra in the identification of plasticisers, and the qualitative and rough quantitative analysis of plasticiser mixtures, are described. The examination by infra-red spectroscopy of extracts from plasticisers, such as alcohols and unsaponifiable material, is described, as an aid to identification of plasticiser mixtures. C—9.

Organic Compounds in the Wet State: Analytical Evaluation of Oxidation Decomposition. F. Feigl and A. S. Haeffer. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 458-467. In German. It was found that many organic compounds acting as precipitating, colouring or masking reagents, when dissolved or suspended in dilute sulphuric or nitric acid, are completely destroyed by heating with alkali persulphate in the presence of silver nitrate as catalyst, allowing clear, colourless solutions to be obtained. Mercaptans are destroyed, with the formation of sulphur. Soluble and insoluble inorganic-organic compounds are destroyed, liberating inorganic cationic or anionic components. Cobalt (III) α-nitroso-β-naphtholate, antimony (III) pyrogallate, and the molybdenum-benzoinoxim precipitate, have proved resistant. Analytical applications of the catalytically accelerated oxidation with alkali persulphate are indicated. There are seventeen references. C—9.

Complex Ions: Analytical Uses. I. Titration of Calcium and Magnesium; Determination of the Hardness of Water. F. L. Hahn. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 583-594. In German. Calcium and magnesium, alone or in admixture, may be titrated alkalimetrically by means of solutions containing a mixture of the quaternary and tertiary salts of bismethylene iminodiacetic acid. If indicators are used the error for a titration of 100 ml. of water is said to be less than 5 mg. $CaCO_3$/litre; in potentiometric titrations an accuracy of 1 mg. $CaCO_3$/litre may be obtained. Even smaller quantities of calcium or magnesium can be estimated if the water and the reagent are mixed in given proportions and the *pH* of the mixture is measured. C—9.

Thioacetamide: Application in Quantitative Analysis. VII. Determination of Lead. H. Flaschka and H. Jakobljevich. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 606-609. In German. The precipitation of lead sulphide from acid and alkaline solution by means of thioacetamide has been investigated. Conversion of the sulphide to sulphate is found to give results whose deviations from the theoretical values do not exceed the errors in weighing. There are seven references. C—9.

Automatic Fraction Collector for Chromatographic Separations. Donald F. Durso, Elwyn D. Schall and Roy L. Whistler. *Analyt. Chem.*, 1951, 23, No. 3, pp. 425-427. In order to reduce the labour required in chromatographic separations where sizable quantities of materials are involved, an electronically controlled apparatus has been devised to feed different developers to a column and to collect the effluents in separate receivers. The apparatus has been used for the fractionation of hydrolysates of guaran, xylan and starch. C—9.

Automatic Operations in Analytical Chemistry. Gordon D. Patterson, Jr., and M. G. Mellon. *Analyt. Chem.*, 1951, 23, No. 1, pp. 101-115. An attempt has been made to review the very large and rapidly expanding subject of automatic measuring devices used in quantitative analysis. The following headings give an idea of the scope of the review: means of sample selection and handling; methods of separating the desired constituent or interfering constituent; measurements of weight, volume and density; manometry, viscometry, magnetometry, thermometry, titrimetry, chronometry, emissimetry, sonimetry, absorptiometry (in the infra-red, visible, ultra-violet and X-ray regions of the spectrum), thermoconductometry, turbidimetry, refractometry, diffractometry, reflectometry, conductometry, and potentiometry; and measurement of electric current, dielectric constant, and radioactivity. There are four hundred and eighty-three references. C—9.

Buffered Filter Paper Chromatography of the Amino Acids. Earl F. McFarren. *Analyt. Chem.*, 1951, 23, No. 1, pp. 168-174. A method has been devised in

which it is possible to separate by one-dimensional chromatography each of twenty amino acids in a mixture, by using several solvents buffered at a selected *pH*. Ninhydrin can be the sole developing reagent, and the amino acids can be identified by referring only to their R_f values or relative positions. The improved separation is said to enable quantitative determination of amino acids by direct photometry, elution or similar methods with greater accuracy. There are ten references. C—9.

Organic Compounds: Characterisation. Robert L. Peck. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 97-101. This paper is a review of new reactions and techniques which elucidate the structure of organic compounds. The material reviewed is divided into three sections: methods for determination of purity, methods for determination of physical properties, and methods concerning the organic chemistry of the compounds to be characterised. There are one hundred and twenty-nine references. C—9.

Terminal Carboxylic Groups in Proteins: Characterisation: Application to Insulin. Claude Fromageot, Marian Jutisz, Denise Meyer and Lucien Penasse. *Biochim. Biophys. Acta*, 1950, **6**, No. 2, pp. 283-289. In French. A method employing a suspension of hydrides of lithium and aluminium in N-ethylmorpholine is described, by means of which only the free carboxyl groups of a protein are reduced to primary alcohol groups. The resulting primary amino-alcohols are identified by means of paper chromatography after hydrolysis of the protein and subsequent extraction. Periodic acid is employed in quantitative determinations. Application of this method to insulin shows that in the elementary unit of insulin (molecular weight about 12,000) two molecules each of glycocoll and alanine possess free carboxylic groups. The terminal alanine belongs to the peptide chains of Sanger's fraction A, the terminal glycocoll to those of fraction B. The R_F values of fifteen amino-alcohols in various solvents have been determined. C—9.

Chemical Methods (Inorganic). H. N. Wilson. *Annual Reports on the Progress of Chemistry*, 1950, **47**, pp. 373-388. This is a review of the literature in the section on analytical chemistry. There are one hundred and ninety-eight references. (See *J. Textile Institute*, 1951, **42**, A577.) C—9.

Chemical Methods (Organic). H. E. Stagg. *Annual Reports on the Progress of Chemistry*, 1950, **47**, pp. 388-399. This is a review of the literature in the section an analytical chemistry. There are one hundred and thirty-five references. (See *J. Textile Institute*, 1951, **42**, A577.) C—9.

Chemical Spectroscopy. Wallace R. Brode. *A.S.T.M. Proceedings*, 1950, **50**, pp. 513-559. This, the twenty-fourth Edgar Marburg Lecture, surveys the application of spectroscopy to chemical analysis. There are sixty-one references. C—9.

Chromatographic Separation Employing Ultraviolet Absorbency Ratios. Morton Beroza. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1507-1510. A method for detecting impurities in chromatographic zones through the use of ultra-violet absorbency ratios has been applied to the separation of the two main constituents of the crystalline alkaloid wilfordine. The method may be generally applicable to the chromatographic or countercurrent separation of compounds which absorb in the ultra-violet, and possibly to compounds which absorb in other parts of the spectrum. There are nine references. C—9.

Chromatographic Separation of the Hexone Bases on "Wofatit C". H. Rauen and K. Felix. *Hoppe-Seyl. Z.*, 1948, **283**, pp. 139-152 (through *Brit. Abstr.*, 1950, A II, May, p. 608). Arginine, histidine and lysine are quantitatively adsorbed from neutral solution on a column of Wofatit C, whereas other amino-acids are not adsorbed. The hexone-base-nitrogen of gelatine and the arginine-nitrogen of clupein-C were quantitatively determined by this method. Clupein-A was shown to be a mixture of at least three substances by chromatographic separation on the column. Details for preparing the resin in a suitable form are given. C—9.

Chromatographic Systems. Harold H. Strain. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 25-38. This paper is a review of the many recent advances in chromatography. The extent of the review may be inferred from the following headings: chromatography as an interpretative aid; common properties of chromatographic systems; chromatographic apparatus; formation of chromatograms;

non-mobile phases in chromatographic systems; mobile phases in chromatographic systems; reversal of phases in chromatographic systems; specificity of chromatographic systems; specificity of electro chromatographic systems; specificity in relation to molecular structure; distribution of solutes in sorption zones; sorption gradients in chromatographic systems; theories of chromatography; sorptive properties of various substances; terminology; chromatography by adsorption; chromatography by ion exchange; chromatography by partition; chromatography with impregnated paper; paper chromatography; chemichromatography; and location of resolved substances. There are four hundred and twenty references. C—9.

Chromatography of Ions. I. Theory of Chromatometry. E. N. Gapon and T. B. Gapon. *J. gen. Chem. USSR*, 1949, **19**, pp. 1627-1634 [*U.S. transl.*, (9), a49-a57] (through *Brit. Abstr.*, 1950, A I, July, p. 423). There is shown to be a linear relation, $\lambda = \alpha v + \beta$, between the zone length, λ, of the cation in the exchange-ion chromatogram, and the volume, v, of a solution of the same cation of definite concentration, where α and β are constants. The equation is derived from the $Cu^{\cdot\cdot} - Co^{\cdot\cdot}$ chromatogram on Permutit. Comparison of the coefficient α, and the zone length in the ideal chromatogram, makes it possible to demonstrate that both zones of the chromatogram contain the sodium ion with one of the cations ($Cu^{\cdot\cdot}$ and $Co^{\cdot\cdot}$). The zone length is approximately proportional to the ion concentration in the initial solution for constant solution volume. The length of the zones in the chromatogram depends on the concentration of the remaining ions in the solution; therefore, chromatometry is found to be quantitative only for an ion of which the adsorption is many times greater than that of the other ions. C—9.

Coatings. T. G. Rochow and R. W. Stafford. *Analyt. Chem.*, 1951, **23**, No. 2, pp. 212-216. This paper is a review of recent advances in organic high polymer coatings, and in their associated oils, pigments and solvents. The review does not include inorganic coatings such as vitreous enamels and metals. There are one hundred and sixty-four references. C—9.

Colorimetric Method for Determination of Traces of Carbonyl Compounds. Gerald R. Lappin and Leland C. Clark. *Analyt. Chem.*, 1951, **23**, No. 3, pp. 541-542. A method involving the use of 2, 4-dinitrophenylhydrazine and potassium hydroxide is described, for the quantitative determination of traces of aldehydes or ketones in water, organic solvents, or organic reaction products. The method is said to be most useful in the range of carbonyl concentration from 10^{-4} to 10^{-6} molar, wherein few, if any, other methods give reliable results. Aldehydes and ketones, both aliphatic and aromatic, as well as some diketones, may be determined by this method. C—9.

Copper Estimation by Means of Dithizone. Robert Delavault and Mlle. Ruth Irish. *C. R. Acad. Sci.*, 1951, **232**, No. 25, pp. 2318-2320. In French. The paper describes conditions suitable for the determination of copper by means of an acetone solution of dithizone. C—9.

Oils: Determination of Copper and Iron by Amperometric Titration. Thomas D. Parks and Louis Lykken. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1503-1505. A method is described for the determination of copper and iron in organic residues (such as those obtained from oils) by reduction in a silver reductor, and amperometric titration with dichromate ion at a rotating-platinum electrode. The titration procedure is said to be rapid, precise, and sensitive to 0·02 mg. of iron or copper. The method is said to be particularly suitable for the analysis of copper and iron in lubricating oils, because other elements normally present in these oils do not interfere. There are nine references. C—9.

Hydroxy Compounds in Amine Mixtures: Determination. Sidney Siggia and Irene R. Kervenski. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 117-118. A method has been devised for determining alcohols and other hydroxy compounds in amine mixtures. After acetylating the mixture, the alcohols, now converted to esters, can be quantitatively removed by saponification, while the amines, acetylated to amides, remain unaffected. There are eight references. C—9.

Superoxide Oxygen: Determination. Edgar Seyb, Jr., and Jacob Kleinberg. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 115-117. A method has been devised for the determination of superoxide oxygen in solid materials. The solid is treated with

a mixture of glacial acetic acid and diethyl phthalate. No secondary decomposition of peroxide was found to occur. There are seven references. C—9.

Trivalent and Tetravalent Manganese: Determination. W. S. Fyfe. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 174-175. A method of estimating the tetrahalide of manganese in the presence of the trihalide is described. Manganese tetrachloride in the presence of acetylacetone gives up chlorine to the acetylacetone and stabilises as trihalide. The chlorinated acetylacetone will release free iodine from acidified potassium iodide, the liberated iodine being a measure of the original tetrahalide. C—9.

Distillation. Arthur Rose. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 38-41. This paper is a review of recent advances in the distillation, analysis and testing of petroleum and related materials, and of coal products. Low temperature distillation analysis and miscellaneous applications of distillation analysis are also reviewed. There are one hundred and four references. C—9.

Essential Oils and Related Products. Ernest Guenther and Edward E. Langenau. *Analyt. Chem.*, 1951, **23**, No. 2, pp. 217-220. This paper is a review of new analytical procedures for essential oils and related products. There are seventy-one references. C—9.

Anionic Detergents in Solution: Estimation by Hartley Titrations. Kathleen Swanston and R. C. Palmer. *J. Soc. Dyers Col.*, 1950, **66**, No. 12, pp. 630-632. A method for the estimation of anionic detergents is described. It is a modification of Hartley and Runnicles' method (*Proc. Roy. Soc.*, 1938, A168, p. 424—see *J. Textile Institute*, 1939, **30**, A206), no indicator being used; either cationic or anionic detergent can be used in the burette. The method is said to be at least as accurate as other published methods and to be quicker and more straightforward. There are six references. C—9.

Evaluation of Three Iron Methods Using a Factorial Experiment. L. K. Reitz, A. S. O'Brien and T. L. Davis. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1470-1473. The importance of using statistical techniques in analytical chemistry is pointed out, and the advantages of Fisher's factorial design technique in testing the precision of an analytical method are stressed. The application of an analysis of variance to data obtained by a factorial experiment is discussed. Statistical techniques are illustrated by a study of three colorimetric methods for iron. There are eleven references. C—9.

Extraction. Lyman C. Craig. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 41-44. This paper is a review of recent advances in extraction methods, and concerns itself almost exclusively with separations. Counter-current distribution and continuous stage extraction are also dealt with. There are seventy-seven references. C—9.

Filling Devices for Burettes and Pipettes. F. L. Hahn. *Analyt. Chim. Acta*, 1950, **4**, No. 6, pp. 573-576. In German. Filling devices for pipettes and burettes are described which are cheap, easy to assemble, and swift and accurate in use. C—9.

Folin Colorimetric Procedure for Amino Acids. N. Howell Furman, George H. Morrison and Arthur F. Wagner. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1561-1562. A study of the Englis and Fiess modification of the Folin colorimetric method for the estimation of amino acids, indicates that the method is not adequate when the amino acids are present in mixtures of different types. There are eight references. C—9.

Food. John R. Matchett. *Analyt. Chem.*, 1951, **23**, No. 2, pp. 221-227. This paper is a review of new procedures which are of use in the food industry for the measurement of the following: moisture; proteins and amino acids; metallic ions; fats; enzyme activity; carbohydrates; vitamins; colour, odour and taste; spoilage and contamination; and various other properties and constituents. There are two hundred and four references. C—9.

Paper Chromatography of Carbohydrates: Improved Techniques. Allene Jeanes, C. S. Wise and R. J. Dimler. *Analyt. Chem.*, 1951, **23**, No. 3, pp. 415-420. In the application of paper chromatography to the separation of disaccharides and oligosaccharides, a study was made of the relationships between the degree of resolution of the sugars, their R_F values, and solvent composition. A multiple development technique was worked out to improve the resolution of

sugar mixtures while retaining all the components on the paper sheet. The relationships established are thought to provide a basis for selecting optimum conditions for the separation of a wide variety of reducing sugars. There are sixteen references. C—9.

Inorganic Gravimetric Analysis. P. E. Beamish and W. A. E. McBryde. *Analyt. Chem.*, 1951, 23, No. 1, pp. 59-66. This paper is a review, and deals with recent developments in general analytical procedures, and in specific analytical procedures for light alloy elements, naturally radio-active elements, alkali and alkaline earth elements, steel-forming elements, non-ferrous elements, rare earth elements, noble elements, non-metallic elements, and halogens. There are one hundred and sixty-three references. C—9.

Iodometric Determination of Ozone of High Concentration. E. D. Boelter, G. L. Putnam and E. I. Lash. *Analyt. Chem.*, 1950, 22, No. 12, pp. 1533-1535. The iodometric method for the determination of 4 to 20 per cent. (by weight) ozone was standardised by the gas-density method. It was found that potassium iodide absorbents in the *pH* range 2·3 to 12·3 give correct results for concentrations of ozone up to 20 per cent., if the solution is acidified with sulphuric acid before titration with sodium thiosulphate. Addition of aluminium chloride to the absorption solutions, in concentrations up to 0·055 N, was found to cause no error. There are nineteen references. C—9.

Ion Exchange. Robert Kunin. *Analyt. Chem.*, 1951, 23, No. 1, pp. 45-46. This paper is a review of recent developments in the application of ion exchange to analytical chemistry. Topics reviewed include: the theory of ion exchange; the use of ion exchange for the separation of ionic species; ion exchange chromatography; and the uses of ion exchange in determination of total electrolyte concentration, in removal of interfering elements, and in physical chemical measurements. There are eighty-six references. C—9.

Kjeldahl Microdigestions in Sealed Tubes at 470° C. Lawrence M. White and Marion C. Long. *Analyt. Chem.*, 1951, 23, No. 2, pp. 363-365. Kjeldahl digestions for the microdetermination of heterocyclic nitrogen were carried out in heavy-walled sealed glass tubes at 470° C. with concentrated sulphuric acid and mercuric oxide catalyst. At this temperature the digestion is complete in a fraction of the time usually needed for heterocyclic compounds. The accuracy and precision are found to be good because there is no possibility of nitrogen loss due to thermal decomposition of ammonium bisulphate or by bumping. There are eleven references. C—9.

Copper: A Method for Quantitative Estimation with Particular Reference to Proofed Jute Fabrics. W. G. Macmillan and P. C. Das. *J. Appl. Chem.*, 1951, 1, March, pp. 132-135. A method is described for the estimation of copper in proofed jute fabrics. Copper in the presence of excess ammonia is estimated volumetrically by titration at the boil against a glucose solution previously standardised with a copper solution under identical conditions. C—9.

Microdetermination of Free Formaldehyde. Morris Tanenbaum and Clark E. Bricker. *Analyt. Chem.*, 1951, 23, No. 2, pp. 354-357. A spectrophotometric procedure, which is said to be sensitive, reproducible and rapid, has been developed for the determination of free formaldehyde in the presence of combined formaldehyde (formals) and of many organic compounds. Optimum conditions have been established for the development and stabilisation of the characteristic red colour in the time-sensitive reaction of formaldehyde with phenylhydrazine and potassium ferricyanide. The method affords a simple means of following reactions which utilise formaldehyde, and its usefulness in the plastic industry and in toxicological work is suggested. There are eleven references. C—9.

Multiple-Paper Chromatogram. William L. Porter. *Analyt. Chem.*, 1951, 23, No. 3, pp. 412-413. The usefulness of paper chromatography is extended from a submicro-qualitative tool to a semimicro-preparative tool by a new apparatus, the "Chromatopack", which consists of a pack of Whatman No. 1 filter-paper strips compressed between two stainless steel plates. The zones obtained from mixtures of organic acids and alkaloids were separated and yielded up to 10 mg. of each constituent. C—9.

Spectrographic Analysis: Multipurpose Method. V. G. Perry, W. M. Weddell and E. R. Wright. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1516-1518. A quantitative spectrographic technique using sodium nitrate as a common matrix, and an alternating current arc as the source of excitation, has been developed and found to be particularly useful in the analysis of (1) sodium salts which are easily converted to sodium nitrate, (2) other inorganic materials which are soluble in nitric acid, (3) organic materials which can be wet-ashed, and (4) refractory materials requiring fusion or other extended chemical treatment. Forty-two elements may be determined with an accuracy approaching 5 per cent. of the amount present. There are six references. C—9.

Rubbers: Natural and Synthetic. Norman Bekkedahl. *Analyt. Chem.*, 1951, **23**, No. 2, pp. 243-253. This paper reviews new methods used in the chemical analysis and physical testing of natural and synthetic rubber. Test methods applied to compounding ingredients, and to materials used in the manufacture of synthetic rubbers, are omitted. The review includes sections on (1) chemical analysis, (2) ageing, (3) latex, (4) unvulcanised rubber, and (5) vulcanisates. Section (4) covers molecular properties, viscosity, and evaluation and grading, of unvulcanised rubber; section (5) covers the static tension and compression of vulcanisates, their hardness, abrasion, adhesion, and tear, and dynamic and low-temperature tests. There are two hundred and nineteen references. C—9.

Chromatographic Column: New Type. John M. Miller and J. G. Kirchner. *Analyt. Chem.*, 1951, **23**, No. 3, pp. 428-430. A chromatographic column which is self-supporting, and has no containing envelope, is described. The "chromatobar" is made from a suitable adsorbent, and plaster of Paris. After development, the location of the resolved zones can be determined by spraying on the sides of the column a suitable reagent, which could be scraped off before recovery of the resolved compounds. A device is described for distributing solvent to the column, for development. The operation of the column was demonstrated with some terpenes. C—9.

Objective Method for Determining Melting Point. Ferenc Kardos. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1569-1570. In Kofler's method of determining the melting point of a substance by observing the change of light intensity, where such change occurs, the microscope used has been replaced by a selenium photocell. C—9.

Paper Chromatography of Amino Acids. Effect of *pH* of Sample. Alton J. Landua, Robert Fuerst and Jorge Awapara. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 162-168. The *pH* of a sample, whether of an individual amino acid or of a mixture, has been found to affect the spread of a spot and its position on the final chromatogram. The spread and position at different *pH* are illustrated for several amino acids. It is suggested that the data may be used to determine what *pH* will result in the most compact spots and most advantageous positions on a final chromatogram for a desired separation; also, they may serve as a basis for further interpretation and theoretical speculation on the mechanisms of these separations. There are six references. C—9.

Paper Chromatography of Inorganic Cations. Part II. Michael Lederer. *Anal. Chim. Acta*, 1951, **5**, No. 2, pp. 185-190. The R_F values of some metals were measured in ethyl, *iso*propyl, butyl and amyl alcohols containing hydrochloric acid. In most cases the R_F values increase with a decrease in the number of carbon atoms of the alcohol. Specific separations were obtained for thallium and zirconium. C—9.

Paper Chromatography of Inorganic Cations. Part III. W. R. Walker and M. Lederer. *Anal. Chim. Acta.*, 1951, **5**, No. 2, pp. 191-194. Mixtures of aliphatic alcohols containing hydrochloric acid were examined as solvents for the paper chromatography of cations. C—9.

Paper Chromatography. I. Instruments and Techniques. II. Physical and Geometric Factors. III. Kinetic Studies. Ralph H. Müller and Doris L. Clegg. *Analyt. Chem.*, 1951, **23**, No. 3, pp. 396-411. These three papers are concerned with the phenomena involved in chromatographic separations in paper. Typical techniques, and new ways of using instrument assemblies to get greater precision, are described. It is shown, by precise semi-automatic methods, how the influence of geometric shape factors can be determined and predicted. The influence of vapour saturation, temperature, and previous history of the paper,

is established. It is shown that the motion of liquids through the paper can be predicted accurately by a knowledge of their surface tension, viscosity, and density. With these techniques, it is considered possible to predict much of the behaviour of a given paper with respect to suitability for chromatographic work, and to extend the methods to the kinetic behaviour of the individual fractions undergoing separation. There are sixteen references in all. C—9.

Paper Chromatography of Organic Acids. J. B. Stark, A. E. Goodbran and H. S. Owens. *Analyt. Chem.*, 1951, 23, No. 3, pp. 413-415. The authors describe a method suitable for detecting many organic acids or their salts in plant extracts or other biological media. The use of several developing solvent mixtures has been investigated. The R_F values for eighteen organic acids were measured. The effect on R_F values of hydration of paper, water content of solvents, temperature of development, and presence of inorganic acids, was studied. In many cases an inversion of R_F values was obtained by altering the composition of the developing solvent. There are twelve references. C—9.

Polarographic Theory, Instrumentation, and Methodology. James J. Lingane. *Analyt. Chem.*, 1951, 23, No. 1, pp. 86-97. This paper is a review of polarographic literature from 1948 to 1950. The theory reviewed includes the theory of diffusion current, current-time curves during drop life, reaction-rate theory applied to polarographic waves, the influence of maximum suppressors on wave characteristics, and the influence of drop time on half-wave potential. The instruments described include several manual instruments, visible recording polarographs, an automatic *m*-measurer (measuring the rate of flow of mercury from the dropping electrode), special dropping electrodes, and cells. Several photographs are included. The section on methodology reviews work on derivative polarography, oscilloscopic polarography, solid micro-electrode current-voltage curves, polarography in liquid ammonia, and polarography in fused salt media. There are sixty-one references. C—9.

Potentiometric Titrations. N. Howell Furman. *Analyt. Chem.*, 1951, 23, No. 1, pp. 21-24. This paper is a review of potentiometric titration methods applied in chemical analysis. Mention is made of processes involving precipitation and complex formation; acid-alkali processes; oxidation-reduction processes; the iodine Karl Fischer method for the estimation of small amounts of water in oils, greases, *etc.*; ferricyanide processes; and of the new amperometric and coulometric titration techniques. There are ninety-one references. C—9.

Precision Colorimetry. (Application to Determination of Manganese.) Irving G. Young and C. F. Hiskey. *Analyt. Chem.*, 1951, 23, No. 3, pp. 506-508. To provide a test of the transmittance-ratio approach to colorimetric measurements, the analytical determination of manganese was studied. The method developed utilises periodate oxidation of manganese, followed by a comparison of the unknown with a known solution of high absorbance. There are fourteen references. C—9.

Preparation of Bubbler Tips. Charles L. Gordon. *Analyt. Chem.*, 1951, 23, No. 2, p. 394. A simpler method of manufacture is described for the glass bubbler tips of Branham and Sperling (*J. Research Nat. Bur. Standards*, 1939, 22, pp. 701-5), which are used to disperse a gas into an absorbing solution. C—9.

A Reversible Indicator for Use in Oxidimetric Titrations with Standard Sodium Hypochlorite. R. Belcher. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 468-471. In the titration of arsenite solutions with a hypochlorite, it has been found that tartrazine may be substituted for Bordeaux* as an indicator. Tartrazine has the advantage of acting reversibly. Providing the excess of hypochlorite does not exceed 0·3 ml. 0·05 N hypochlorite, the end-point can be passed and re-passed three or four times. *(BCI, No. 88.) C—9.

A Reversible Indicator for Use in Titrations with Potassium Iodate. R. Belcher and S. J. Clark. *Analyt. Chim. Acta*, 1950, 4, No. 5, pp. 580-582. In determining accurately the end-point in potassium iodate titrations a new indicator, *p*-ethoxychrysoidine, has been found to have the advantage of reversibility over the indicators used by Smith and Wilcox. C—9.

Review of Analytical Chemistry. *Analyt. Chem.*, 1951, 23, No. 1, pp. 2-101. This is the third annual review of analytical chemistry and includes the following papers: Light Absorption Spectrometry by M. G. Mellon; Infra-red Spectro-

scopy by Robert C. Gore; Ultra-violet Absorption Spectrophotometry by E. J. Rosenbaum; X-Ray Absorption by Herman A. Liebhafsky; Electron Microscopy by F. A. Hamm; Potentiometric Titrations by N. Howell Furman; Chromatographic Systems by Harold H. Strain; Distillation by Arthur Rose; Extraction by Lyman C. Craig; Ion Exchange by Robert Kunin; Organic Microchemistry by C. L. Ogg and C. O. Willits; Inorganic Microchemistry by Philip W. West; Inorganic Gravimetric Analysis by F. E. Beamish and W. A. E. McBryde; Volumetric Analytical Methods for Organic Compounds by Walter T. Smith, Jr., and Robert E. Buckles; Gas Analysis by Leonard K. Nash; Nucleonics by Charles L. Gordon; Polarographic Theory, Instrumentation and Methodology by James J. Lingane; and Characterisation of Organic Compounds by Robert L. Peck. C—9.

The Separation of Monosaccharides by Ion Exchange. Joseph X. Khym and Leonard P. Zill. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 2399-2400. In a letter the authors describe a method they are developing for the separation of monosaccharides. The method involves the formation of negatively charged sugar-borate complexes which can be separated by the technique of ion exchange. Fructose, glucose, mannose and galactose, dissolved in weak sodium borate solution, were quantitatively adsorbed on strong-base anion exchangers. Elution was carried out and the fractions analysed for sugar. Recoveries of the individual sugars were essentially quantitative. C—9.

Saponification Numbers: A Simple and Rapid Method for Determining. F. L. Hahn. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 577-579. In German. Potassium hydroxide dissolved in a mixture of glycol-monoethylether and xylene is found to be an ideal reagent for the determination of saponification numbers. C—9.

Spectrophotometric Determination of Total Phthalic Anhydride (in Alkyd Resins and other Phthalate Esters). O. D. Shreve and M. R. Heether. *Analyt. Chem.*, 1951, 23, No. 3, pp. 441-445. The authors describe a new method, based on ultra-violet absorption spectrophotometry, for the determination of total phthalic anhydride in alkyd resins and other phthalate esters. The method is said to be more generally applicable than the standard Kappelmeier procedure, and to give excellent results in the presence of esters of other polybasic acids, coating materials, and other compounds which interfere with the Kappelmeier method. Its usefulness in laboratories concerned with the analysis of coatings and related materials is suggested. C—9.

Sodium: Studies in the Analytical Chemistry of— IV. The Alkalimetric Determination of Sodium after Precipitation as Sodium Zinc Uranyl Acetate. R. Belcher and A. J. Nutten. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 595-601. The method of Morton for the alkalimetric determination of sodium after precipitation as sodium zinc uranyl acetate, has been extended to the range 1-20 mg. of sodium. An indicator method is found satisfactory for amounts of sodium less than 8 mg. if the triple salt is dissolved in the minimum amount of water, while a potentiometric method may be used for the complete range of sodium, preferably at a dilution of not less than 1 mg. triple salt per ml. of water. It has been shown that calcium, in amounts furnished by the Lawrence Smith fusion of silicates, will not interfere in this alkalimetric determination of sodium. There are ten references. C—9.

Surface-Active Agents: Scheme for Qualitative Analysis. Bernard Wurzschmitt. *Z. Anal. Chem.*, 1950, 130, pp. 105-185. In German. The author has worked out a complete analytical scheme for surface-active agents, comprising twenty-seven different steps. The nature of many organic compounds likely to be present is explained, and new tests are described for the easy identification of inorganic constituents (such as alkali, carbonate, phosphate or sulphate), and the classification of organic constituents. It is pointed out that compounds containing a surface-active cation are likely to be ternary and quaternary compounds of oxygen, sulphur, nitrogen, and phosphorus, or compounds containg trivalent nitrogen atoms which do not give solutions containing quaternary ammonium compounds; or they may be polyalkylene oxide addition products. The undissociated compounds which are active are likely to be fatty acids condensed with alkylolamines or polyalcohols. Eight new test tube reactions are given for the numerous compounds with active anions, and other qualitative tests are described. Special attention is paid to precipitation reactions with

numerous dyes, and an apparatus is described for determining degree of saponification. C—9.

Thermogravimetric Analysis. XLI. Determination of Antimony. Josette Morandat and Clément Duval. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 498-503. In French. Using Chevenard's thermobalance, the pyrolysis curves of the precipitates which usually serve for the determination of antimony have been traced. Various methods are critically evaluated. The standard method using the sulphide can be replaced with advantage by precipitation with thiocyanate (the best of all methods), by heating to 170-292° C. the sulphide precipitated by hydrogen sulphide, or by oxidizing the sulphide to antimony pentoxide by means of ferric compounds. Methods using tannin or oxine were not found satisfactory. Methods of determination and their corresponding temperature limits are listed. There are twelve references. C—9.

Thermo-Gravimetric Analysis. XLVI. Critical Survey of Methods for Iron Determination. Clément Duval and Dat Xuong. *Anal. Chim. Acta*, 1951, 5, No. 2, pp. 160-169. In French. The authors have traced, by means of the Chevenard thermobalance, the pyrolysis curves of twenty-two precipitates used for the gravimetric determination of iron. Eight methods are suggested as being suitable for automatic determination, particularly precipitation by ammonia and hydrazine, by dimine, and by neocupferron. The difference in stability of the cupferronates allows a simple separation of iron and titanium. There are thirty references. C—9.

Thermogravimetric Analysis. XLVII. Determination of Bismuth. Mlle. Simonne Panchout and Clément Duval. *Anal. Chim. Acta*, 1951, 5, No. 2, pp. 170-184. In French. Thirty-six methods for the gravimetric determination of bismuth have been examined in the light of pyrolysis curves prepared with the aid of the Chevenard thermobalance. Fifteen of these methods are considered suitable for automatic determination, the best being Majumdar's phenyldithiobiazolonethiol method. There are thirty-nine references. C—9.

Thioacetamide in Quantitative Analysis: Use. IV. Determination of Copper. H. Flaschka and H. Jakobjevich. *Analyt. Chim. Acta*, 1950, 4, No. 6, pp. 482-485. In German. The precipitation of copper from hot solution by means of thioacetamide has been investigated. Normalities of the various acids used in precipitation are given. The precipitation is also rapid and quantitative from ammoniacal solution. After wet incineration, the precipitate is ignited to the oxide, dissolved in sulphuric acid, and titrated iodometrically. For amounts of copper varying between 15 and 310 mg., the maximum deviations from the calculated values are about 0·3 mg. There are eight references. C—9.

Analysis by Absorption Spectrophotometry: A Variable Reference Technique. I. Theory and Discussion. J. H. Jones, G. R. Clark and L. S. Harrow. *J. Ass. Off. Agric. Chem.*, 1951, 34, No. 1, pp. 135-148. The article points out the advantages of a technique in which the absorption of an unknown solution is compared to that of a known solution containing the same materials in the same concentration as in the unknown. As this generally involves changing the composition of the reference solution during the course of the measurement, the technique is called "Variable Reference Spectrophotometry". The spectrophotometer is used to indicate the balance of absorption, and not to measure the actual absorption. (See also following abstract.) C—9.

Analysis by Absorption Spectrophotometry: A Variable Reference Technique. II. Practical Applications. J. H. Jones, G. R. Clark and L. S. Harrow. *J. Ass. Off. Agric. Chem.*, 1951, 34, No. 1, pp. 149-179. Practical methods of utilising the variable reference technique in visual and ultraviolet spectrophotometry are given. Several examples of the use of the procedure in the analysis of mixtures are discussed. (See also preceding abstract.) C—9.

Versatile Paper Partition Chromatographic Apparatus. Arnold J. Singer and Leonard Kenner. *Analyt. Chem.*, 1951, 23, No. 2, pp. 387-388. A frame is described which rigidly supports the paper at both ends during the phase of solvent separation by capillary ascent. The frame is considered to have many advantages in paper partition chromatography, and up to 50 one-dimensional chromatographs can be developed at one time. There are eleven references. C—9.

Volumetric Analytical Methods for Organic Compounds. Walter T. Smith, Jr., and Robert E. Buckles. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 66-73. This paper is a review of volumetric analytical methods recently published. Analytical techniques for the following are included:—elements: carbon, halogens, nitrogen, oxygen, phosphorus and sulphur; functional groups: acetyl, acids, alcohols, aldehydes, ketones, amides, amines, amino acids, diazonium groups, hydrazines, oxirane group, peroxides, phenols, unsaturated groups, and germanium derivatives; other materials: Grignard reagents, mixtures, silicon derivatives, sugars and water. There are one hundred and fifty-one references. C—9.

Water Analysis. S. K. Love. *Analyt. Chem.*, 1951, **23**, No. 2, pp. 253-257. This paper is a review of recent procedures applied to the analysis of water. Methods are reviewed for the determination of:—calcium and magnesium; hardness; copper, iron, zinc and lead; sodium and potassium; *pH*, alkalinity and carbon dioxide; chloride; fluoride; nitrite and nitrate; phosphate; chlorine; dissolved oxygen; and biochemical oxygen demand and oxygen consumed. There are one hundred and one references. C—9.

X-Ray Absorption. Herman A. Liebhafsky. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 14-16. This paper is a review of recent advances in X-ray absorption spectrometry, absorptiometry, and fluorescence; both recently published work and work not yet published are dealt with. Important developments in the analysis of biological materials are included. There are twenty-nine references. C—9.

Formation of a Borotartrate Compound: Application to the Microchemical Determination of the Borate Ion. J. A. Gautier and P. Pignard. *Mikrochem.*, 1951, **36/37**, pp. 793-800. In French. In the presence of tartaric acid, borate ions react with barium ions to produce a precipitate of constant composition and low water-solubility. An empirical formula, $Ba_3B_2C_{12}H_8O_{24}.4H_2O$, has been ascribed to this presumably complex borotartrate. The qualitative detection of boron by means of this characteristic precipitate has a limiting concentration of 10^{-5}. A method is described for the gravimetric determination of boron on the semi-micro scale, and a further method is presented for the volumetric determination of boron on the micro scale. C—9.

Oxidising Agent—"Silver Peroxide": Application to Micro-Analysis. Kenjiro Kimura and Yukio Murakami. *Mikrochem.*, 1951, **36/37**, pp. 727-740. In English. The reaction product of silver nitrate and ammonium persulphate, the composition of which corresponds at least to some extent to a peroxide of silver, has been evaluated as an oxidising agent for the colorimetric determination of manganese. It appears to be very suitable for this purpose, and its action is not affected by the presence of other ions provided that these are not themselves coloured. It can also be used with advantage for the volumetric determination of cerium. It is stated that the method is accurate, that results are reproducible even with small quantities, and that the oxidation process itself is simple and rapid to carry out. C—9.

A Bridge Unit for Filter-Paper Chromatography. E. Kawerau. *Biochem. J.*, 1951, **48**, No. 3, pp. 281-283. An all-glass bridge unit for filter-paper strip partition chromatography is described. The unit can be used for any of the standard methods of one-dimensional partition chromatography, and is supplied with ventilators to give a method of analysis in which continuous evaporation takes place from the paper. Examples for carbohydrates are quoted. C—9.

Mixed Films of Eucolloids: Behaviour Towards Solvents. A Contribution to the Analytical Chemistry of High Polymers. Kurt Thinius. *Farben, Lacke, Anstrichstoffe*, 1950, **4**, pp. 381-385 (through *Chem. Abstr.*, 1951, **45**, No. 4, p. 1459[e]). C—9.

Eucolloids: Identification by Solubility. A Further Contribution to the Analytical Chemistry of High Polymers. Kurt Thinius. *Deut. Farben-Z.*, 1951, **5**, pp. 73-81 (through *Chem. Abstr.*, 1951, **45**, No. 12, p. 5058[d]). Characteristic solvents, non-solvents, non-solvent pairs mutually activated to act as solvents, and precipitating conditions, are selected to distinguish the following: water-soluble eucolloids (such as gelatin, starch, carboxymethyl- and methylcellulose, polyvinyl alcohol, polyvinyl methyl ether and polyvinyl pyrrolidone); cellulose ethers (such as ethyl-celluloses B and BS, propylcellulose, benzylcellulose); cellulose esters (such as formate, acetates, tripropionate, acetobutyrate, isoheptylate [Cellit IH], stearate [Celloret], and nitrocelluloses of different N

contents); chlorinated polymers (polyvinyl chloride, chloro-rubber [Pergut], chlorinated Buna [Bunalit]); and some chain polymers (polyamides, polyurethans). Data are also given on the distinction of nitrocellulose from linters and from wood pulp; on distinguishing polymers by their tolerance towards diluents; and on distinguishing various degrees of substitution of saponified polyvinyl acetates, nitrocelluloses, ethylcelluloses, and cellulose acetates. C—9.

Chromatography of Organo-Metallic Complexes. A. K. Al-Mahdi and Cecil L. Wilson. *Mikrochem.*, 1951, **36/37**, pp. 218-223. In English. True chromatography may be used to separate inorganic ions by forming complexes with organic reagents and chromatographing these from organic solvents. Separations in the ions copper, iron, nickel and cobalt, using sodium diethyldithiocarbamate as reagent, have been investigated both qualitatively and quantitatively. The accuracy of determination may be increased considerably by converting to another complex after separation. C—9.

Colorimetric Quantitative Analysis of Mixtures of Sugars. H. Rüggeberg. *Mikrochem.*, 1951, **36/37**, pp. 916-923. In German. A method is described for the analysis of small quantities of mixtures of glucose, maltose and dextrins. It consists of a combination of two colorimetric methods in which the response to these sugars differs. The reagents are 3,5-dinitro-salicylic acid and ammonium phosphomolybdate. An average error of ± 4 per cent. is reported. C—9.

Complexones. XVIII. Ferrous and Ferric Complexes with Ethylenediaminetetraacetate and their Redox Equilibrium. G. Schwarzenbach and J. Heller. *Helv. chim. Acta*, 1951, **34**, No. 2, pp. 576-591. In German. The ferro-ferri redox potential was determined over a *pH* range of 2 to 10, in the presence of varying quantities of ethylene diamine tetra-acetate. In order to appreciate the significance of the results obtained, the behaviour of the pure ferro- and ferri-complexes was examined by the addition of hydrochloric acid and potassium hydroxide respectively. Equilibrium constants for various reactions were obtained. C—9.

Cuproine [2,2′diquinolyl]: Use in Colorimetric Determination of Copper. J. Hoste, A. Heiremenas and J. Gillis. *Mikrochem.*, 1951, **36/37**, pp. 349-361. In French. A study has been made of 2,2′diquinolyl as a colorimetric reagent for the determination of traces of copper. The cuprous complex with this substance can be extracted with *iso*-amyl alcohol, and copper determinations down to as low as $0{\cdot}5\ \gamma$ per millilitre can be made from this solution. The complex is stable from *pH* 2 to 9. Several of the more common anions in the ratio of 1,000:1 copper do not interfere, notable exceptions being CN^-, CNS^-, and I^-. A considerable number of cations at similar concentrations also exert no interference. The method, which is described in detail, has been applied to the determination of copper in water (down to $0{\cdot}02\ \gamma$ per millilitre). The accuracy is of the order of one per cent. There are eight references. C—9.

Curve of Apparent Dissociation and pK of Methyl Red and Bromophenol Blue. L. Di Bella. *Boll. Soc. Med-Chir. Modena*, 1948, **48**, pp. 477-479 (through *Chem. Abstr.*, 1951, **45**, No. 1, p. 25°). The effect of glycine on pK values of Bromophenol Blue and Methyl Red was studied graphically using a Pulfrich photometer. Values of the pK of indicator solutions at various *pH* values in the presence and absence of glycine were compared. In solutions of 10^{-1}, 10^{-2} and 10^{-3} M glycine, the pK of Bromophenol Blue was raised from 4 to 4·09, 4·06 and 4·05 respectively; the pK of Methyl Red was changed from 5 to 3·69, 4·74 and 5·63 respectively. Glycine does not appear to shift the pK values of the indicators in direct proportion to the difference in pK and isoelectric point. C—9.

1,2-Cycloheptane-dionedioxime as a Micro-Gravimetric Reagent for Nickel. Raymond C. Ferguson, Roger C. Voter and Charles V. Banks. *Mikrochem.*, 1951, **38**, Nos. 1-2, pp. 11-14. In English. 1,2-cycloheptane-dionedioxime (heptoxime), previously reported as a water-soluble gravimetric reagent for nickel, has been shown to be successful on the microgravimetric scale, where the procedure followed is a modification of macro-scale procedure. Nickel heptoxime is precipitated in a micro-filter beaker, and the precipitate is weighed after being dried at 110-120° C. for at least an hour. The commonly encountered ions do not interfere, or may be masked by treatment with complex-forming agents. C—9.

Manganese: Determination of Minute Quantities with Arnold's Reagent. Wilhelm Prodinger. *Mikrochem.*, 1951, 36/37, pp. 580-584. In German. The colour reaction of manganese with Arnold's reagent (p-p'-tetramethyldiaminodiphenyl-methane) was closely investigated. It occurs only at *pH* 3 to 4. The interference of the ferric ion depends not on its percentage excess but on the absolute concentrations of iron and manganese. Masking of the iron with phosphoric acid or disodium phosphate was not successful owing to change of *pH*. The detection of manganese in iron-containing solutions is reliable only after the iron has been removed by extraction from the hydrochloric acid solution by ether, the remaining solution being then buffered to about *pH* 3 by sodium acetate. The detection limit is 0·001 γ and the limiting concentration 1 γ manganese per millilitre. The calibration curve for quantitative colorimetric determination is given. C—9.

Metal Ion Indicators. III. Complex Formation of Pyrocatechol-3,5-disulphonic acid with Ferric Ions. G. Schwarzenbach and A. Willi. *Helv. chim. Acta*, 1951, 34, No. 2, pp. 528-539. In German. Pyrocatechol-disulphonic acid forms with iron salts two blue complexes of composition $Fe[C_6H_2O_2SO_3(SO_3H)]$ and $Fe[C_6H_2O_2(SO_3)_2]^-$, a violet complex anion $Fe[C_6H_2O_2(SO_3)_2]^{5-}$, and a red complex anion $Fe[C_6H_2O_2(SO_3)_2]^{9-}$. In the presence of nitrilo-triacetate a blue-violet " mixed complex " is obtained:

$$\left[Fe\begin{matrix}[N(CH_2.COO)_3] \\ [C_2H_2O_2(SO_3)_2]\end{matrix} \right]^{4-}.$$

The formation constants of these associated compounds have been determined potentiometrically and photometrically. C—9.

Sugars: A Micromethod for Determination. J. E. Stone and M. J. Blundell. *Canad. J. Res.*, 1951, 28, B, No. 11, pp. 676-682. Certain pentoses and hexoses were determined by measuring spectrophotometrically the yields of furfural and hydroxymethylfurfural obtained on steam distilling with syrupy phosphoric acid. Mixtures of sugars have been separated on a paper strip chromatogram and the individuals determined, without separate extraction, by steam distilling into phosphoric acid. C—9.

Chromium: Microscopic Detection as Chromium (III). Philip W. West and Lawrence Granatelli. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 63-65. In English. Trisodium phosphate is recommended as a reagent for the microscopic detection of chromium (III). Sensitivity of the test is 6 γ of chromium (III) in a volume of 0·01 ml. Of particular importance is the fact that aluminium and iron (III) do not react with the reagent to form crystalline precipitates. Mercury (II) also gives characteristic crystals. C—9.

Carbonyl Groups: Micro-Determination with 2,4-Dinitrophenyl-hydrazine. W. Schöniger and H. Liev. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 165-167. In German. The authors describe the principle of a carbonyl group determination in which the substance being examined is caused to react with a solution of 2,4-dinitrophenyl-hydrazine of known concentration. The proportion of the reagent not consumed in forming a hydrazone is reduced with titanous chloride, and the excess of titanous chloride is back titrated with ferric ammonium sulphate. C—9.

Amide and α-Amine Nitrogen: Micro-Determination by a Mixture of Concentrated Hydrochloric and Nitric Acids. M. Renard and Paulette Deschamps. *Mikrochem.*, 1951, 36/37, pp. 665-670. In French. A study of the reaction of a mixture of concentrated hydrochloric and nitric acids on α-amino-monocarboxylic acids shows that it proceeds:

$$R-CHNH_2-COOH+HCl+HNO_2=R-CHCl-COOH+N_2O+2H_2O.$$

Quantitatively, the volume of gas collected corresponds closely to the amine nitrogen. Provided that there is no secondary reaction between the molecule and the nitric acid, it has been found possible to develop a simple and accurate method for the microdetermination both of the amine nitrogen in α-amino acids and α-aminosulphonic acids, and of the amide nitrogen of amides and sulphonamides. C—9.

Micro-Scheme for Cations without Hydrogen Sulphide. M. C. Alvarez Querol and C. L. Wilson. *Mikrochem.*, 1951, 36/37, pp. 224-238. In English. After precipitation of the insoluble chlorides, and treatment with nitric acid to remove

tin and antimony, the remainder of the "common" cations may be separated schematically using only sodium sulphate and ammonium hydroxide as precipitants. This avoids the use of either sulphuretted hydrogen or a potential sulphide ion reagent. On the micro scale this method has been extended to include with the more usual cations the elements tungsten, titanium, molybdenum and zirconium. C—9.

Copper in Biological Materials with Sodium Diethyldithiocarbamate: New Modified Colorimetric Method for Determination. Kenjiro Kimura and Yukio Murakami. *Mikrochem.*, 1951, 36/37, pp. 958-966. In English. All the defects hitherto associated with the determination of copper with sodium diethyldithiocarbamate can be easily avoided by the addition of hydroxylamine. C—9.

Cations: New (Paper) Chromatographic Method for Separating. A. Lacourt, Gh. Sommereyns, Ed. De Geyndt and Od. Jacquet. *Mikrochem.*, 1951, 36/37, pp. 117-132. In French. The cations iron, titanium, aluminium, vanadium, nickel, cobalt and copper were separated chromatographically on filter paper (Whatman No. 1 and No. 4) in the form of their chlorides. The chromatograms were developed downwards by means of organic solvents. Some qualitative and quantitative separations of various mixtures were successfully carried out. The method is of particular interest both where chemical separation is laborious, and where it is necessary to determine minute impurities. Small additions of organic liquids to the solvent may alter the course of the chromatography, and it is possible that use of this fact can be made in detecting and determining impurities within the solvent. C—9.

Oxalic Acid Determination: Photometric Method. Rubens Salomé Pereira. *Mikrochem.*, 1951, 36/37, pp. 398-406. In English. A method for the quantitative determination of oxalic acid, based on Eegriwe's colour test for glycollic acid, is described. The principle of the method is to reduce oxalic acid to glycollic acid by means of nascent hydrogen generated by magnesium powder and dilute sulphuric acid. By heating with a solution of 2,7-dihydroxynaphthalene in concentrated sulphuric acid, formaldehyde from the glycollic acid condenses with the reagent to form tetrahydroxydinaphthylmethane, which is oxidized to a deep red dyestuff by atmospheric oxygen. Methods of avoiding the effect of interfering substances have been studied. The method is very simple and sensitive, and is applicable to a great variety of materials. C—9.

Oxycellulose. II. Estimation of Carboxyl Groups in Cellulosic Materials. G. M. Nabar and C. V. Padmanabhan. *Proc. Indian Acad. Sci.*, 1950, 31A, pp. 371-380 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2663^{f}). The carboxyl groups of oxycelluloses prepared from Indian cotton have been determined by reaction with an iodate-iodide solution followed by quantitative analysis of the iodine released. C—9.

Percuprimetric Titration of Various Amino Acids and Proteins: Time-Reaction Curves. G. Beck. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 1-10. In German. When the differential percuprimetric titration of amino acids and proteins is used, reaction curves are obtained which are characteristic of specific materials, and which permit of certain deductions concerning their constitution. Among the amino acids dealt with are glycocoll, α and β alanine, lysine, etc., and among the proteins considered are silk fibroin, keratin, and gelatin. C—9.

Percuprimetric Titrations: The Chemistry of Trivalent Copper. G. Beck. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 152-159. In German. Several titrations of organic compounds with potassium cupri-periodate are described, and the system copper(III)/copper(II) is discussed. Time and temperature of reaction affect the quantity of reagent required. Among the organic substances tested were starch, glycogen, sugars, formaldehyde, aceto-acetic acid (weighed as ester), maleic acid, hydroquinone, pyrocatechol, vanillin, aniline, and vitamin B^{1}. C—9.

Silicic Acid: Photometric Micro-Determination. C. Ferrari. *Mikrochem.*, 1951, 36/37, pp. 585-593. In German. A new procedure for the determination of silica with the aid of the molybdenum blue reaction is described. The method is based on a study of the various kinds of molybdenum blue, and their conditions of existence. The process is suitable for the determination of both the soluble and the total silica present. Blue coloration in blank tests is completely eliminated, thus permitting absolute determinations. The great stability of the

colorations which can be obtained with excess of reducing agent suggests that this method will be especially suited to series of analyses. C—9.

Pyrogallolcarboxylic Acid as a Reagent for Determining Calcium. A. Okáč and J. Pech. *Chem. Listy*, 1948, pp. 161-163 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9857[h]). A saturated aqueous solution of 2,3,4-pyrogallol-1-carboxylic acid gives a blue-violet coloration with Ba^{++}, Sr^{++} and Ca^{++} and, if previously treated with 9 N sulphuric acid, can be used for detecting Ca^{++} in the presence of the other two ions. The test can be used for the colorimetric determination of calcium in drinking water. C—9.

Amino Acids in Proteins: Quantitative Micro-Determination. G. Gorbach. *Mikrochem.*, 1951, 36/37, pp. 902-910. In German. The importance of micro-methods for the characterisation of proteins is pointed out. The use of alkaline permanganate as the oxidising agent gives a more rapid and more accurate method for determining the nitrogen content of protein hydrolysates. A simple and systematic scheme has been worked out for the determination of the essential amino acids. The time required for a complete analysis is about 13 hours. There are twenty references. C—9.

Amino-Acids Separated by Paper Chromatography: Quantitative Recovery and Colorimetric Estimation. L. Fowden. *Biochem. J.*, 1951, 48, No. 3, pp. 327-332. The author describes a ninhydrin method for the estimation of amino acids after separation by filter-paper chromatography. The method uses a slightly modified form of the Moore and Stein (1948) reagent and can determine 1-30 μg. α-amino nitrogen of an amino acid. The variable values of the paper blank previously obtained in ninhydrin colorimetric methods, are found to be low and constant if ammonia absorbed on the paper is first removed. A new method of drying the papers allows quantitative recoveries of the amino acids, and makes control chromatograms of standard amounts of amino acids unnecessary. C—9.

Cellulose: Rôle in Filter-Paper Chromatography. D. P. Burma and B. Banerjee. *Science and Culture*, 1950, 15, pp. 363-364 (through *Chem. Abstr.*, 1951, 45, No. 9, p. 3753[b]). Experimental results show that cellulose may not play a completely passive rôle in paper chromatography. The effect of partition was precluded by using pure water as solvent for fifteen α-amino acids and seven sugars in runs employing the usual ascending and descending techniques. Constant and reproducible Rf values in the range 0·80-0·95 were obtained for all compounds (except tryptophane), indicating a weak but definite adsorption. C—9.

Micro-Analytical Reactions: Sensitivity. II. H. Malissa. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 33-48. In German. After a detailed discussion of the concepts relating to the sensitivity of analytical reactions and their inter-relationships, the paper continues a previous communication (*Mikrochem.*, 1950, 35, p. 266—see C.1951/339) by giving tests recommended in the fourth report of the "International Commission for New Analytical Reactions and Reagents". Their absolute and practical sensitivities (that is, sensitivity towards the pure substance, and towards the same substance in the presence of other ions) are presented in tabular form. Characterization of the sensitivity of analytical reactions is discussed. C—9.

Titrimetric Processes: Some New Indicators. A. J. Nutten. *Metallurgia*, 1950, 42, pp. 216-219 (through *Chem. Abstr.*, 1951, 45, No. 1, p. 61[e]). The more important of the newly developed indicators are discussed, and listed with their colours in acid and alkali, and their *pH* range. They include single-compound indicators, and mixed types, screened types, and universal types of indicator. There are thirty-one references. C—9.

Spot Test Analysis: Development, Present State and Outlook. Fritz Feigl and Philip W. West. *Mikrochem.*, 1951, 36/37, pp. 191-205. In English. It is emphasized that spot tests are truly microchemical in character. The value of spot testing in many types of analysis is surveyed. There are thirty-nine references. C—9.

Micro-Nitrogen Determination by the Kjeldahl-Parnas Method: Technique. Volker Klingmüller. *Z. Anal. Chem.*, 1950, 131, pp. 17-24 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9864[e]). A new technique is described, with pictures and precise directions, for the estimation of small amounts of nitrogen. 0·20-0·50 mg. of nitrogen can be distilled in 1-1·5 minutes. C—9.

Trace Elements: Preliminary Concentration for Spectrochemical Determination. F. Burriel-Marti and J. Ramirez-Muñoz. *Mikrochem.*, 1951, **36/37**, pp. 495-512. In French. The objective of preliminary concentration, in spectrochemical methods, is the greatest possible elimination of the principal elements which may interfere with, or entirely mask, the lines due to the trace elements. Among the techniques discussed are those based on the use of particular chemical reagents, either because of their specific precipitating action, or because of the process of co-precipitation which they provoke. There are twenty-one references. C—9.

Chloride: Ultramicro Determination. R. Viswanathan. *Biochem. J.*, 1951, **48**, No. 2, pp. 239-241. The article describes an adaptation of the Van Slyke and Hiller method for the ultramicro determination of chloride. C—9.

Organic Complex-Forming Agents: Use in the Isolation and Determination of Metals by Means of Shaking-Out Reactions. Ernst Abrahamczik. *Mikrochem.*, 1951, **36/37**, pp. 104-112. In German. There is a constantly increasing tendency to make use of extraction reactions for the separation and determination of metals, using for example sodium diethyldithiocarbamate, dimethylglyoxime, hydroquinoline, nitroso-naphthol, Cupferron, quinalizarin, or acetyl-acetone. "Shaking-out" procedures (in which a component of a substance dissolved in a liquid may be separated by shaking with another, more or less immiscible liquid, in which the component to be extracted dissolves) are used either for "extractive accumulation" of trace elements, or for the removal of the main interfering substances prior to the determination of the trace elements, in order to avoid the loss of these elements by co-precipitation or adsorption. There are forty-four references. C—9.

Catalysed Hydrogen Peroxide Decompositions. G. A. Bottomley. *Analyt. Chim. Acta*, 1950, **4**, No. 6, pp. 566-572. A reaction which takes place between aqueous hydrogen peroxide and potassium hydrogen phthalate at *pH* 4 and 98° C., and which is catalysed by 10^{-7} *M* cupric or ferric ion, is reported. The products of the reaction are unidentified brown organic materials and carbon dioxide. A possible mechanism for the course of the reaction is suggested. C—9.

Hydrolytic Decomposition of Ferric Oxychloride under the Influence of Moist Air at Room-Temperature. Harald Schäfer. *Z. anorg. Allg. Chem.*, 1951, **264**, Nos. 5-6, pp. 249-254. In German. Should ferric oxychloride be exposed to moist air at room-temperature, and should the vapour-pressure exceed a certain characteristic value, the iron oxychloride will undergo hydrolytic decomposition. A new phase is formed and contains 0·33 gram-atom of chlorine per gram-atom of iron. This phase is crystalline and birefringent, and has a specific X-ray diagram. The nature of the reaction is discussed with special reference both to duration of exposure-time of the iron salt to the moist air, and to the significance of vapour-pressure. C—9.

Mellor's Modern Inorganic Chemistry. G. D. Parkes. London, Longmans, 1951, xxi+967 pages. The new edition of this textbook represents a further revision of the 1939 text, as compared with which it includes a new chapter on metals, a combination of the chapter on inert gases with that on the atmosphere, and an expansion of the chapter on the radio-elements. C—9.

New Inorganic Fibre Crystal. L. Ebert and R. Fiala. *Sitzungsber. Öster. Akad. Wiss.*, 1950, **159**, No. 3-4, pp. 414-418 (through *J. Soc. Dyers. Col.*, 1950, **66**, No. 12, p. 659). The compound $Na_2Sb_4S_7.2H_2O$ forms a saturated mixed crystal with sodium sulphide of composition $Na_{2.8}Sb_4S_{7.4}$, which has a fine fibre structure of about 100 Å diameter. C—9.

Hydrogen Peroxide Solutions: Changes of Density on Cooling and Freezing. Paul A. Giguère and Pierre Geoffrion. *Canad. J. Res.*, 1950, **28**, B, No. 10, pp. 599-607. The densities of binary solutions of hydrogen peroxide and water from 0° C. down to their respective freezing points were measured by the dilatometric method with an estimated precision of $\pm 0{\cdot}0003$ g. per ml. Under certain conditions hydrogen peroxide solutions were found to decompose on melting. C—9.

Dichromate Reduction Rate at a Steel Surface in Air-Free, Acetic Acid Solution. Norman Hackerman and Ray M. Hurd. *J. Electrochem. Soc.*, 1951, **98**, No. 2, pp. 51-56. Apparatus and method are described for determining the rate of

reduction of dichromate ion in an air-free, acetic acid solution in which steel is corroding. The effects of dichromate concentration, acid concentration, temperature, steel surface area, order of addition of the chemicals, and presence of sodium chloride, were studied. It is shown that dichromate can be an effective corrosion inhibitor in these systems since the reduction rate eventually becomes negligible. A mechanism is proposed, based on high *pH* in the liquid film adjacent to the metal, and control of the reaction rate by diffusion processes.
C—9.

Hydrogen Peroxide and Its Analogues. 2. Phase Equilibrium in the System Hydrogen-Peroxide/Water. William T. Foley and Paul A. Giguère. *Canad. J. Chem.*, 1951, 29, No. 2, p. 123-132. A precision freezing point apparatus with platinum resistance thermometer is described; this was used to investigate the system hydrogen-peroxide/water over the whole concentration range. Contrary to what has previously been reported, water and hydrogen peroxide do not appear to form solid solutions together. There are twenty-one references. C—9.

Nitrogen Tetroxide: Investigation of the Kinetics of Oxidation to Nitric Acid. H. Heinrich Franck and Wolfgang Schirmer. *Z. Elektrochem.*, 1950, 54, pp. 254-263 (through *Chem. Abstr.*, 1951, 45, No. 1, p. 26[e]). The reaction $2N_2O_4+2H_2O+O_2 \rightleftharpoons 4HNO_3$ was studied at 20 atmospheres pressure and over a temperature range of 20° C. to 80° C. Different mechanisms are said to predominate in regions characterised by the concentration of nitric acid and the temperature. The mechanisms are described. The reverse reaction was also studied. C—9.

Nitrogen Peroxide, N_2O_4, Molecule: Theoretical Study. Odilon Chalvet and Raymond Daudel. *Compt. rend.*, 1950, 231, pp. 855-856 (through. *Chem. Abstr.*, 1951, 45, No. 7, p. 2728[f]). A molecular-orbital treatment of the structure of nitrogen peroxide is given which leads to interatomic distances that agree, within experimental error, with those determined by X-ray measurements.
C—9.

Strong Acids: Action on Acetylated Glycosides. VIII. A New Synthesis of Melibiose. Bengt Lindberg. *Acta Chem. Scand.*, 1951, 5, No. 3, pp. 340-342. β-Melibiose octa-acetate has been prepared from β-6-glucose β-galactoside octa-acetate by the transglycosidation method. There are six references. (See *J. Textile Institute*, 1951, 42, A411.) C—9.

Protein Chemistry: Advances. Volume VI. M. L. Anson, K. Bailey, and J. T. Edsall (Editors). New York: Academic Press, 1951, xi+549 pages. The present volume includes articles on the electron microscopy of macromolecules (by Ralph W. G. Wyckoff), light scattering in protein solutions (by Paul Doty), poly-α-amino acids (by Ephraim Katchalski), and cross linkages in protein chemistry (by Johan Bjorksten). C—9.

β-Alanine/Copper Complexes: Effect of *pH* of Solution. Jean Curchod. *C. R. Acad. Sci.*, 1951, 232, No. 24, pp. 2210-2212. In French. The author has studied the effect of the proportions of the constituents in equilibrium when β-alanine and copper sulphate are mixed in solution. The free cupric ions were determined electrometrically, and spectrophotometric methods were employed for the cuprous and cupric β-alanines. C—9.

β-Alanine/Copper Complexes: Spectrophotometric Studies of Dilute Solutions. Jean Curchod and Marguerite Quintin. *C. R. Acad. Sci., Paris*, 1951, 232, No. 18, pp. 1662-1664. In French. An account is given of a spectrophotometric study of β-alanine/copper complexes. Cuprous and cupric β-alanine complexes have been identified at *pH* 5·70. C—9.

Formaldehyde: Conversion into Sugars with a Baryta Catalyst. R. Cornubert and C. Renaud. *C. R. Acad. Sci., Paris*, 1950, 230, pp. 897-899; *ibid*, 600 (through *Brit. Abstr.*, 1950, A II, November, p. 1145). The authors give a detailed account of the course of the conversion of formaldehyde into sugars using a catalyst which consists of various molar strengths of barium carbonate precipitated in the presence of barium oxide of two molar strengths. During the reactions the lower sugars are present always in small amount, showing that they are rapidly transformed into higher sugars which decompose extensively. C—9.

"Browning" Reaction of Proteins with Glucose. A. Mohammad, H. Fraenkel-Conrat, and H. S. Olcott. *Arch. Biochem.*, 1949, 24, pp. 157-178 (through *Brit. Abstr.*, 1950, A II, July, p. 796). The rate of "browning" is found to be proportional to temperature and *pH*. Free NH_2-groups are probably

the primary site of the reactions, and decrease as the reaction proceeds. Guanidyl-groups—but not amide groups—are thought to be involved secondarily; tryptophane, and possibly histidine and tyrosine, are also involved. C—9.

Dehydrogenation Reactions by the Action of Free Radicals. Alexander Schönberg and Ahmed Mustafa. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, p. 2401. In their study of the dehydrogenating power of long-lived free radicals, the authors give a table of compounds which all dissociate into free radicals of long life and which possess strong dehydrogenating power. Some reactions, with temperatures, are given. C—9.

Deutsches Jahrbuch für die Industrie der plastischen Massen, 1945/1950. Karl Fabel (Editor). Berlin (Wilmersdorf): Pansegrau, 1951, 472+xxxii pages. In German. This German year book for the plastics industry contains reviews of the literature for 1945-1950, on cellulose and cellulose derivatives, protein materials, and natural resins; amino plastics, pheno plastics, polyamide, polyureas, polyurethanes, polyethylenes, polytetrafluorethylenes, polyethers, polyesters, polyvinyl and polyacrylic compounds, polyvinylidene compounds, silicones, and thioplastics; processing methods; and nomenclature. There is a list of trade marks and trade names. C—9.

Etherification of Cellulose, especially Carboxymethylation. S. Rydholm. *Svensk Papperstidning*, 1950, 53, 30th September, pp. 561-567 (through *J. Soc. Dyers Col.*, 1950, 66, No. 12, p. 664). The carboxymethylation of cellulose has been studied with reference to the distribution of the ether groups on primary and secondary hydroxyls, and comparisons are drawn with previous experimental results on other cellulose ethers. It appears that in the etherification of mercerised cellulose an initial reaction occurs up to a 0·15 degree of substitution, during which only primary hydroxyl groups are etherified. All hydroxyls react subsequently at exactly the same rate up to high degrees of substitution. The distribution of the ether groups on the secondary hydroxyls of the cellulose on carboxylation agrees statistically with sulphoethylation but not with methylation and ethylation. Equations for the substitution of the different hydroxyl groups are deduced, and the causes of the initial selective etherification are discussed. C—9.

Glycosidic Methoxyl Groups in Methanolyzed Cellulose. Richard E. Reeves, Lawrence W. Mazzeno, Jr., and Carroll L. Hoffpauir. *Text. Res. J.*, 1951, 21, No. 2, pp. 78-81. Oxidation by a glycol-cleavage reagent has proved that the acid-labile methoxyl groups in "methanolysed" (see *J. Amer. Chem. Soc.*, 1946, 68, p. 1383) cellulose are linked in glycosidic combination (one per molecule), and not in an acetal structure, which would require two such groups per molecule. Evidence confirming the glycosidic structure was obtained by fractionating methanolysed cellulose to the point where number-average molecular weights must be calculated on the basis of one methoxyl group per molecule. The rate of removal of methoxyl groups from methanolysed cellulose upon acid hydrolysis was re-investigated. The rate is roughly comparable to the rate of hydrolysis of methyl gluco-pyranosides. These findings contradict the basis for a claim, based on copper number determinations, that the methoxyl groups of methanolysed cellulose are very rapidly hydrolysed and are of the acetal type. There are four references. [From author's abstract.] C—9.

Grignard Reaction: History and Application: Constitution of Organo-Magnesium Compounds. René Locquin, Paul Karrer, Jean Colonge, Pierre Jolibois and Robert Kullmann. *Bull. Soc. chim. France*, 1950, No. 11 (Special Number), pp. 897-932. In French. In this special number, issued on the occasion of the fiftieth anniversary of the first publication on the organo-magnesium reactions by Grignard, papers are given on the events leading to the discovery of these reactions (Locquin), their importance in organic chemistry research (Karrer), a further history of their development (Cologne), and a detailed study of the constitution of organo-magnesium compounds (Jolibois and Kullmann). C—9.

Corn: The Interrelationships of Proteins and Amino Acids. Kenneth J. Frey. *Cereal Chem.*, 1951, 28, No. 2, pp. 123-132. Individual plant samples of two types of maize were analysed for total protein, zein, tryptophane, valine, leucine and isoleucine. Correlation coefficients were worked out for the amino acids and for zein. There are nineteen references. C—9.

Macromolecules. H. N. Rydon. *Annual Reports of the Progress of Chemistry*, 1950, **47**, pp. 246-253. This is a review of the literature in the section on organic chemistry. There are seventy-two references. (See C.1951/3224.)
C—9.

Proteins: New Chemical Inquiries into the Structure. M. P. Desnuelle. *Bull. Soc. chim. Fr.*, 1949, [v], **16**, D, pp. 252-264 (through *Brit. Abstr.*, 1950, A II, May, p. 607). This paper is a review with many references, including a discussion of total hydrolysis, estimation of mixed amino-acids, modification of the list of "natural" amino-acids, and the presence of amino-acids of the D-series. Partial hydrolysis, both chemical and enzymic, is also discussed, as well as the reactivity of free thiol, phenolic, and amino groups in proteins on the point of denaturation. C—9.

Olefins: Noncatalytic Polymerisation to Lubricating Oils. F. M. Seger, H. G. Doherty and A. N. Sachanen. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 2446-2452. Excellent lubricating oils have been prepared by the non-catalytic polymerisation of normal 1-olefins. Optimum temperature, time, pressure, and olefin chain length and structure, for the best yield, have been investigated. There are twenty-seven references. C—9.

Amylose: Oxidation with Hypochlorite and Hypochlorous Acid. C. H. Hullinger and Roy L. Whistler. *Cereal Chem.*, 1951, **28**, No. 2, pp. 153-157. Wheat and potato amylose in aqueous suspension, on treatment with increasing concentrations of hypochlorite at *pH* 7, showed a decrease in viscosity and in the rate of retrogradation, and an increase in the quantity of aldehyde and carboxyl groups. About one-half of the introduced carboxyl groups were found to be of the uronic acid type. If, during the hypochlorite oxidation of potato amylose the *pH* was varied between 2 and 12, the carboxyl content was found to increase and the aldehyde content to decrease with ascending *pH*. No significant change was observed in the uronic acid content, the viscosity, or in the total number of end groups per unit weight of potato amylose. The degree of polymerisation appeared to be the same at all levels of *pH* investigated. There are twenty references. C—9.

Cellulose: Oxidation by Chromium Trioxide—A New Method for Determining Accessibility. Ronald E. Glegg. *Text. Res. J.*, 1951, **21**, No. 3, pp. 143-148. In this study of the oxidation of cellulose by chromium trioxide in acetic-acid/acetic-anhydride solution, the initial rate is high and is dependent upon the moles of chromium trioxide per glucose unit in the solution. The rate of oxidation is highly sensitive to different degrees of swelling or accessibility of the cellulose samples, and the method can be used to determine accessibility. Its advantages over other methods of measuring accessibility are listed. There are ten references. C—9.

Polyalkylene Glycol Synthetic Lubricants. W. H. Millett. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 2436-2441. The properties of polyalkylene glycol synthetic lubricants are briefly reviewed. Data from laboratory wear tests, performance tests in hydraulic equipment, and industrial and automotive gear installations show them to have excellent wear resistance. There are eighteen references.
C—9.

Polymeric Additives for Synthetic Ester Lubricants. F. J. Glavis. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 2441-2446. Interest in ester lubricants justifies a study of polymeric additives for these fluids. Data on a single polymer blend in di-2-ethylhexyl sebacate are used to demonstrate the various interpretations possible in discussing viscosity-temperature properties. Viscosity-temperature effects are discussed for blends of representative ester lubricants and a commercially available viscosity index improver. Viscosity increase and viscosity-index improvement are then demonstrated for blends of acrylic polymers and polyesters of high molecular weight in various ester types, including inorganic esters, glycol esters, glycol diesters, alkyl acylated ricinoleates, aryl dibasic acid diesters, aliphatic dibasic acid diesters, and polyesters of low molecular weight. [Author's abstract.] There are twenty-five references. C—9.

Polyvinyl Alcohol. Norbert Platzer. *Modern Plastics*, 1951, **28**, No. 7, pp. 95-96, 98, 161-162, 165-166. After briefly discussing the structure of polyvinyl alcohol (PVA) the author deals with the plasticisation of this polymer with indirect and direct plasticisers. PVA is soluble in water but the solubility can be reduced

by tanning; some methods of carrying this out are reviewed. Two particular uses of PVA, as a textile sizing and finishing agent, and as a synthetic fibre, are mentioned. Finally the properties of PVA (such as solubility in water, insolubility in organic solvents, polarisability and non-toxicity) are discussed in relation to its applications. There are ninety-eight references. C—9.

Polyvinyl Chloride Compounds: Properties. Effect of Phthalate Ester Structure. P. V. Smith, Jr., R. G. Newberg, and D. W. Young. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2576-2579. Three isomeric phthalic acids have been esterified with commercial "isomeric octyl" alcohol—a new primary C_8 alcohol manufactured to overcome the shortage of the primary C_8 alcohols in general use. The properties of the esters are discussed. The esters were compounded with a copolymer of 95 per cent. vinyl chloride and 5 per cent. vinyl acetate and these plasticised resins were evaluated for tensile strength and other properties which measure the quality of a plastic. The plasticised resin containing di-isomeric octyl terephthalate has superior heat and light aging properties and a better brittle temperature than the other two isomeric phthalate-resin compositions. There are ten references. C—9.

Methanol and Hydrogen Chloride: Reaction at 0° C. Richard E. Reeves, Carroll L. Hoffpauir and Robert J. Demint. *Text. Res. J.*, 1951, 21, No. 2, pp. 81-82. Contrary to the finding of Mehta and Pacsu (*J. Textile Institute*, 1950, 41, A132) the authors find that a reagent containing 43 per cent. hydrogen chloride in methanol does give off hydrogen chloride and does form appreciable amounts of water at 0° C. The high copper numbers observed for the methanolysed celluloses are thought to be due to a side reaction—hydrolysis by the water formed in the reagent during the prolonged treatment of the cellulose. C—9.

German Synthetic Lubricants: Review. William A. Horne. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2428-2436. The author reviews the processes used by Germany in World War II to manufacture synthetic lubricating oils. There are twenty-four references. C—9.

Sodium Carboxymethylcellulose, a Water-Soluble Cellulose Derivative. A. C. Muhr. *Chimia* (Switz.), 1948, 2, pp. 242-245 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4444[i]). The preparation, properties and applications of sodium carboxymethylcellulose are reviewed. Its applications include its use in the textile industry as a sizing and waterproofing agent, in washing agents and soaps to increase their dirt-holding capacity, in the paper industry for making greaseproof papers and packaging materials, as a protective colloid for stabilising emulsions, as a thickener for latex emulsions, and in food, toilet and pharmaceutical preparations. C—9.

Drying Oils: Some Aspects of Oxidation. L. Williamson. *J. Oil Col. Chem. Ass.*, 1951, 34, March, pp. 119-129. Recent data relating to the mechanism of the drying or gelation of oils are collated and interpreted in the light of certain research work carried out at the Paint Research Station. It is suggested that whilst in simple oil systems peroxide-initiated mechanisms predominate, in more complex systems different mechanisms may be operative and, in special cases, oxidative polymerisation may be superseded altogether by other types of reaction. There are fifteen references. C—9.

Sulphonated Cross-Linked Polystyrene: A Monofunctional Cation-Exchange Resin. K. W. Pepper. *J. Appl. Chem.*, 1951, 1, March, pp. 124-132. Recent improvements in the performance of ion-exchange resins are discussed, and an account is given of the preparation and properties of sulphonated cross-linked polystyrene. The copolymerisation of styrene and divinylbenzine (DVB) in bead form is described. Cross-linked polystyrene was sulphonated by heating the copolymer with concentrated sulphuric acid at 100° C. in the presence of silver sulphate. After a time depending on the particle size and DVB content of the copolymer, the exchange-capacity of the product attains a limiting value which corresponds to the formation of a monosulphonic acid. Sulphonated cross-linked polystyrene is found to be a hygroscopic gel, whose swelling and shrinking in aqueous solutions are markedly dependent on the degree of cross-linking. The cation-exchange properties of the resin are consistent with those expected of a mono-functional, strongly acidic material. The influence of the extent of cross-linking on the relative affinity-coefficients and rates of exchange of sodium and hydrogen ions are indicated. There are eleven references. C—9.

Zemplen's Glycoside Synthesis. B. Lindberg. *Ark. Kemi Min. Geol.*, 1945, 18, [4-5], No. 9 (through *Brit. Abstr.*, 1950, A II, May, p. 497). The formation of glycosides from acetobromosugar, mercuric acetate and aglucone in boiling benzene is shown to proceed in five stages, each of which can be carried out independently. Details of reactions which produce several glycosides are given at length. C—9.

Linseed Oil: Acceleration and Retardation of Drying. J. d'Ans and K. Meier. *Farbe u. Lack*, 1951, 57, pp. 7-14 (through *Chem. Abstr.*, 1951, 45, No. 7, p. 3166[g]). During air drying, films of linseed oil gain weight rapidly until a maximum is reached; there is then a period of slow, or no further, gain. An investigation of this weight increase has been carried out. C—9.

Cellulose: Accessibility. Harold Tarkov. *Tappi*, 1950, 33, pp. 585-587 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2663[e]). This is a review with twenty-one references. Particular attention is paid to a formylation method originated in part by the author, details of which are to be published later. C—9.

Meerwein Reaction: Application to β-Methylcinnamic Acid and to Methyl Methacrylate. Philibert L'Ecuyer and Charles-A. Olivier. *Canad. J. Res.*, 1950, 28, B, No. 10, pp. 648-651. In French. In the Meerwein reaction, β-methylcinnamic acid is found to react with the aromatic substituted diazonium salts in the same way as cinnamic acid. The equivalent methyl stilbenes are formed. On causing methyl methacrylate to react with various diazonium salts, derivatives of methyl α-chloro-α-methylhydrocinnamate are obtained. C—9.

Carbohydrate Chemistry. H. O. L. Fischer and D. L. Macdonald. *Annual Review of Biochemistry*, 1951, 20, pp. 43-66. This is a review of the literature from October 1949 to October 1950. There are three hundred and thirty-one references. C—9.

Amino Acids and Proteins: Chemistry. K. Bailey and F. Sanger. *Annual Review of Biochemistry*, 1951, 20, pp. 103-130. This is a review of the literature for 1950. There are two hundred and fifty-nine references. C—9.

γ-Butyrolactone and α-Amino-γ-Butyrolactone with Sodium Methyl Mercaptide or Selenide: Cleavage. A Synthesis of Methionine. Hans Plieninger. *Chem. Ber.*, 1950, 83, pp. 265-268 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9919[g]). The method is described. C—9.

Xylan and Cellulose: Comparative Study of the Conditions of Esterification and the Properties. A. A. Konkin and Z. A. Rogovin. *J. Appl. Chem. (U.S.S.R.)*, 1950, 23, May, pp. 536-544 (through *J. Soc. Dyers Col.*, 1950, 66, No. 10, p. 568). Xylan is compared with degraded hydrate cellulose preparations of about the same degree of polymerisation, and found to be more soluble than cellulose in dilute solutions of caustic alkali. The rate of acetylation of xylan was also found to be greater than that of cellulose. Both properties are thought to be due to the absence of the primary alcohol side-group in xylan, and consequent reduction of the intermolecular forces. C—9.

Substituents in Technical Water-Soluble Methyl-Cellulose: Distribution. T. Timell. *Svensk kem. Tidskr.*, 1950, 62, pp. 129-133 (through *Brit. Abstr.*, 1951, B II, January, p. 73). An earlier investigation has been extended to a technical water-soluble, high-viscosity methylcellulose. The distribution of substituents is found to be approximately the same as noted previously for similar ethers, but in this case the primary OH-group was found to be less reactive than the secondary, the OH in the 2 position being most easily converted. Previously it had been found that the 6-OH was more rapidly converted than the secondary ones. The lower reactivity of the primary OH-group may be due either to particularly strong hydrogen bonds, or to the higher acidity of the 2-OH-group. (See *J. Textile Institute*, 1951, 42, A343.) C—9.

Cellulose: Etherification, especially Carboxymethylation. Sven Rydholm. *Svensk Papperstidn.*, 1950, 53, pp. 561-567. In English. (Through *Chem. Abstr.*, 1951, 45, No. 12, p. 5403[a]). The reaction for formation of carboxymethyl cellulose was investigated with particular reference to the distribution of the ether groups on the primary and secondary hydroxyl groups. The etherification of mercerised cellulose is considered to go through an initial reaction, in

which only the primary hydroxyls are etherified. Equations are given for the substitution reaction of the different hydroxyls and possible reasons for the initial selective etherification are discussed. Experimental technique and analytical methods are given. There are twenty-one references. C—9.

Perlon L: Formation from ε-Caprolactam. Arno Matthes. *Makromol. Chem.*, 1951, 5, No. 3, pp. 197-244. In German. The formation of Perlon from ε-caprolactam in the presence of catalysts leads to an equilibrium between the amounts of polymer, lactam, and catalyst, and the degree of polymerisation. Chain growth is counteracted by two different depolymerisation processes: (1) the fission of the chain by the catalyst, and (2) thermal removal of lactam from the ends of the chains. The real formation of Perlon originates not in the combining of lactam and catalyst, but in the "opened" lactam, the so-called "radical". The reaction appears to consist of the addition of "radicals". The growth of chains is terminated by the addition of catalyst residues. This is not final, but regulated by equilibrium of dissociation between the ends of chains and the catalyst. C—9.

Uronic Acid Carboxyl Groups: Nature of the Bonding in Naturally Occurring Pectin. M. Hann. *Makromol. Chem.*, 1950, 5, No. 2, pp. 184-189. In German. Examination of sugar-beet, the pith of citrus fruit (orange), and the pulp of citrus fruit and apple, shows that the uronic acid in aqueous-extracted pectin accounts for all the uronic acid present in the particular parts of the fruit examined. Further, the acid, apart from a small portion (of the order of one per cent.) which occurs in the free state, is found either as an ester with methyl alcohol, or as a salt with a metal. The free acid could be esterified with diazomethane. No evidence of linkage with any form of cellulose was detected. C—9.

Cellulose: Pacsu's Formula. E. Husemann and U. Consbruch. *Makromol. Chem.*, 1950, 5, No. 2, pp. 179-183. In German. From conclusions based on the results of a method for determining the end groups, using potassium permanganate as oxidising agent, Pacsu has proposed a new formula for cellulose. Verification of the method, however, shows that, in the prescribed experimental conditions, not even the end group, glucose, is oxidised, so that only impurities or super-oxidation could account for the results obtained. It is concluded, therefore, that there are no grounds for accepting the Pacsu formula. C—9.

Organic Reactions Volume V. Roger Adams (Editor). New York: Wiley, 1949, viii+446 pages. This series, started in 1942, aims at providing a compilation of all the important synthetic chemical reactions. Each chapter deals with a particular reaction, and includes: a general discussion of method, modifications, examples of applicability, special precautions, a detailed description of the procedure, expected yields, and a table listing the compounds that have been prepared by, or subjected to, the reaction. The present volume is concerned with: the synthesis of acetylenes; cyanoethylation; the Diels-Alder reaction—quinones and other cyclenones; preparation of aromatic fluorine compounds from diazonium fluorborates—the Schiemann reaction; the Friedel and Crafts reaction with aliphatic dibasic acid anhydrides; the Gatermann-Koch reaction; the Leuckart reaction; selenium dioxide oxidation; the Hoesch synthesis; and the Darzens glycidic ester condensation. C—9.

Organic Reactions Volume VI. Roger Adams (Editor). New York: Wiley, 1951, viii+517 pages. This volume has ten chapters, dealing with: the Stobbe condensation; the preparation of 3,4-dihydroisoquinolines and related compounds by the Bischler-Napieralski reaction; the Pictet-Spengler synthesis of tetrahydroisoquinolines and related compounds; the synthesis of isoquinolines by the Pomeranz-Fritsch reaction; the Oppenauer oxidation; the synthesis of phosphonic and phosphinic acids; the halogen-metal interconversion reaction with organolithium compounds; the preparation of thiazoles; the preparation of thiophenes and tetrahydrothiophenes; and reductions by lithium aluminium hydride. C—9.

Parallelism between the Structure of Fat and that of Synthetic Textiles. A. Parisot. *Oléagineux*, 1950, 5, pp. 639-643 and 695-700 (through *Chem. Abstr.*, 1951, 45, No. 11, p. 4528[f]). A textile fibre is formed from unbranched linear macromolecules, placed parallel to one another and connected by secondary bonds of the van der Waals type, and by hydrogen bonds; this is compared to the structure of fat molecules, which have the same parallel placement but weaker

longitudinal cohesion. Comparison between the paraffins or fatty acids and condensation polymers also shows striking resemblances between their melting point curves as a function of the number of carbon atoms and of the flexibility or rigidity of the chain. C—9.

The Polyuronides. C. L. Hilton. *Annual Review of Biochemistry*, 1951, 20, pp. 67-86. This is a review of the literature for 1950. There are one hundred and forty-eight references. C—9.

Sodium Carboxymethylcellulose: Preparation. R. R. McLaughlin and J. H. E. Herbst. *Canad. J. Res.*, 1951, 28, B, No. 11, pp. 731-736. The authors investigated the preparation of sodium carboxymethylcellulose from cellulose, sodium hydroxide and sodium chloroacetate in the presence of water. They studied the effects of temperature, excess of sodium hydroxide, ratio of water to cellulose, time of mixing, and manner of addition of the reagents. The highest degree of substitution attained was 2·8. C—9.

Monocarboxycellulose: Preparation. Z. Rogovin, L. Kondrashchuk, and R. Malakhov. *J. Appl. Chem. (U.S.S.R.)*, 1950, 23, April, pp. 418-427 (through *J. Soc. Dyers Col.*, 1950, 66, No. 10, p. 568). A number of preparations of cellulose, in which the degree of polymerisation varied over a wide range, were oxidised by gaseous nitrogen dioxide so as to yield monocarboxycellulose of 3-4 per cent. carboxyl content (1 carboxyl to 6-8 glucose residues). Tensile strength and other properties of the fibres were studied. When fabrics of bleached cotton, containing varying amounts of water, were treated to give a carboxyl content of 3-4 per cent., the tensile strength was found to increase with the amount of water present. It was found, however, that there was a considerable fall in the resistance to repeated flexure. C—9.

Dicarboxycellulose and its Esters: Preparation of Specimens. A. G. Yashunskaya, N. N. Shorygina, and Z. A. Rogovin. *Zhur. Priklad. Khim. (J. Applied Chem.)*, 1949, 22, pp. 1037-1043 (through *Chem. Abstr.*, 1951, 45, No. 8, p. 3592[h]). The aldehyde groups of dialdehyde-cellulose were oxidised to carboxyl groups by means of chlorous acid to give a product which was shown to be a hemi-acetal of erythronic and glyoxalic acids. Acetates of this product were prepared. C—9.

Monocarboxycellulose and its Esters: Preparation of Specimens. M. Treivas, N. N. Shorygina, and Z. Rogovin. *Zhur. Priklad. Khim. (J. Appl. Chem.)*, 1949, 22, pp. 1214-1224 (through *Chem. Abstr.*, 1951, 45, No. 8, p. 3591[i]). The presence of even a small number of carboxyl groups sharply lowers the solubility of nitrates derived from carboxycellulose; this solubility is less than that of nitrates of alginic or pectic acids. The presence of a carboxyl group in the 6-position of the polysaccharide molecule significantly lowers the rate of acetylation. A monocarboxycellulose was prepared by the oxidation of cellulose (linters) with nitrogen dioxide. The solubility of nitrates of this derivative was determined, and its acetylation investigated. C—9.

Sulphinic Acids: Preparation. William E. Truce and Anna M. Murphy. *Chem. Rev.*, 1951, 48, No. 1, pp. 69-124. In this review of the preparation of sulphinic acids, the subject is dealt with under eight headings. (*a*) *Reduction of sulphonyl halides to sulphinic acids.* In this section 120 sulphinic acids are tabulated, with the reagent used in their preparation, the yield, and relevant references. (*b*) *Sulphination of organometallic compounds*, with a table of 32 sulphinic acids and the organometallic compounds from which they are prepared. (*c*) *Friedel-Craft sulphination of aromatic compounds*, with a table of 20 sulphinic acids prepared in this way. (*d*) *Replacement of a diazonium salt group*, with a table of 60 sulphinic acids prepared from a diazonium salt. (*e*) *Basic cleavage of sulphones*, with a table of 23 sulphinic acids prepared from many more sulphones. (*f*) *Rearrangement of certain o-substituted aromatic sulphones and related types*, with a table of 41 sulphinic acids and the sulphones from which they are rearranged. (*g*) *Miscellaneous methods*, with a table of 68 sulphinic acids prepared in different ways. There are 316 references. C—9.

2,3-Butanediol: Production and Properties. XXXVI. Linear Polyesters of 2,3-Butanediol. R. W. Watson, N. H. Grace and J. L. Barnwell. *Canad. J. Res.*, 1950, 28, B, No. 10, pp. 652-659. New polyesters with basic units containing 6, 7, 8, 9, 10, 13 and 14 chain atoms have been prepared (1) from *laevo*-2,3-butanediol with ethyl oxalate, ethyl malonate, dimethyl terephthalate, maleic

anhydride, and succinic, glutaric, adipic, azelaic, and sebacic acids, and (2) from *meso*-2,3-butanediol with *o*-phthalic anhydride. The purified polyesters, with the exception of the poly-malonate, appear to be composed of regularly recurring acid and diol segments over the molecular weight ranges investigated. Without exception they were found to be amorphous resins or balsams. Polyesters formed from saturated aliphatic dibasic acids become progressively softer as the number of methylene groups in the acid segment increases. The polymeric oxalate, on distillation *in vacuo*, is converted to a macrocrystalline cyclic monomer. C—9.

Rice-Bran Oil and Its Applications. XV. Molecular Distillation of Rice-Bran Oil. Seüchi Ueno, Saburo Komori, and Toshio Agawa. *J. Chem. Soc. Japan*, Ind. Chem. Sect., 1949, 52, 90-91 (through *Chem. Abstr.*, 1951, 45, No. 4, p. 1790[f]). Rice-bran oil was molecularly distilled in a cyclic still at 10^{-4} mm. Free fatty acid distilled out at 100-150° C. can be used as olein in the textile industry. C—9.

Schardinger Dextrins from Starch. Karl Freudenberg and Friedrich Cramer. *Chem. Ber.*, 1950, 83, pp. 296-304 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9924[h]). γ-Dextrin is found to be a ring homologue of α- and β-dextrin. The nitric acid esters of all three show increased optical rotations. The shape of the glucan unit in these dextrins prevents the formation of complex compounds with cuprammonium, whereas amylose does form a complex compound. s-Dextrin is found to be an adduct of two molecules of α-dextrin and one molecule of *sec*-octyl alcohol, whilst r-dextrin is an adduct of β-dextrin with the same alcohol. Other adducts of α- and β-dextrins are mentioned. C—9.

Soluble Starch. Heinrich Meyer. *Die Stärke*, 1950, 2, pp. 250-251 (through *Chem. Abstr.*, 1951, 45, No. 9, p. 4069[h]). This is a historical review with thirteen references. C—9.

A Synthesis of δ-hydroxy-α-Aminovaleric Acid and Its Conversion to Proline. Hans Plieninger. *Chem. Ber.*, 1950, 83, pp. 271-272 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9918[e]). The method is described. C—9.

Universal Adhesives. Hans Hadert. *Farbe u. Lack*, 1950, 56, pp. 399-400 (through *Chem. Abstr.*, 1951, 45, No. 1, p. 388[f]). Twelve formulæ based on nitrocellulose, polyvinyl acetate and polyacrylic esters are given. The effect of mixed polymers, of solvents, and of plasticisers is also discussed. C—9.

Adsorption and Surface Chemistry. F. C. Tompkins. *Annual Reports of the Progress of Chemistry*, 1950, 47, pp. 54-67. This is a review of the literature. There are eighty-six references. See C.1951/3224. C—9.

Adsorption of Some High-Molecular Substances on Active Carbon. I. Claesson and S. Claesson. *Ark. Kemi. Min. Geol.*, 1945, 19 A, No. 5, pp. 1-12 (through *Brit. Abstr.*, 1950, A 1, July, p. 423). The adsorption on active carbon of nitrocelluloses, synthetic rubbers and polyvinyl acetates is found to increase with decreasing molecular weight. With polyvinyl acetates use of the Langmuir relation indicates that the effect is due to an increase of affinity rather than of available space. C—9.

Physical Chemistry: An Advanced Treatise. Volume II. The Properties of Liquids. J. R. Partington. London, Longmans, 1951, xliv+448 pages. This second volume of the work consists entirely of Section VIII, and deals with the properties of liquids under the following headings: theory, density, thermal expansion, compressibility, viscosity, thermal conductivity, surface tension, specific heats, vapour pressure, boiling points, and latent heat of evaporation. There are two appendixes dealing with determinants and matrices, and coordinate geometry of three dimensions. C—9.

Wood Cellulose as compared with Cotton: Chain Length and Chain-Length Distribution. Emil Heuser and Leif Jörgensen. *Tappi*, 1951, 34, pp. 57-67 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4443[h]). The degree of polymerisation (D.P.) of wood cellulose from spruce and aspen was studied on samples prepared in several ways, and compared with the D.P. of cotton from an unopened boll. The viscosity of nitrated samples was used to determine the D.P. The average D.P. of the aspenwood and spruce pulps was of the order of 2,400-2,500 maximum, while that of cotton was nearly 4,000. C—9.

Chlorotrifluoroethylene Polymers: Physical Properties. W. H. Reysen and J. D. Gibson. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2468-2471. The relation-

ships between molecular weight, viscosity, density, and vapour pressure, of a number of fractions of chlorotrifluoroethylene liquid polymers are summarised in tabular and graphical form. Convenient methods are provided and illustrated for applying this information to lubrication and oil-blending problems. There are fourteen references. C—9.

Colloid Chemistry. H. W. Douglas. *Annual Reports of the Progress of Chemistry*, 1950, 47, pp. 76-84. This is a review of the literature. There are one hundred and fifty-seven references. (*J. Textile Institute*, 1951, 42, A577.) C—9.

Colloid Chemistry, Volume VII. Jerome Alexander (Editor). New York, Reinhold, 1950, xi+736 pages. The latest volume in this series on theoretical and applied colloid chemistry consists of forty-three papers arranged in three parts: Theory and Methods, Biology and Medicine, and Technological Applications. The first part includes papers on The Role of the Electric Double Layer in the Behaviour of Lyophobic Colloids (by E. J. W. Verwey), The Effective Depth of the Surface Zone of a Liquid (by J. W. McBain and J. C. Henniker), Laws of Surface Tension as Evidence of Aggregates in Liquids (by George Antonoff), Newtonian Flow in Polymer Chemistry (by Arthur K. Doolittle), and Paper Chromatography of Amino Acids (by Richard J. Block and Herbert A. Sober); the second part has Complexes of Ions with Proteins (by Irving M. Klotz), and the third The Relationship Between Constitution and Mode of Action of Soaplike Colloidal Electrolytes (by A. Chwala), The Relation Between Chemical Structure and Performance of Detergents (by D. S. P. Roebuck), Chemical and Physical Modifications of Textile Fibers, by H. C. Borghetty), Wood—An Example of a Colloid System (by Harold Tarkow and Alfred J. Stamm), Cellophane (by Charles M. Rosser), and Protective Wrappings—British Approach (by C. R. Oswin). C—9.

Regenerated Cellulose: Determination of Degree of Polymerisation and Quantitative Separation of Cotton and Rayon. E. Cerbaro. *Boll. cotoniera*, 1942, 37, 56-57 (through *Chem. Abstr.*, 1950, 44, No. 16, p. 7534[i]). The regenerated cellulose fibre is agitated with caustic soda solution, and after filtering, the dissolved cellulose is determined by oxidation with potassium bichromate. The viscosity of the cellulose solution is measured, and the degree of polymerisation is then calculated from Staudinger's equation. The method is also used to separate cotton and rayon by selective dissolution of the latter in aqueous caustic soda. The residue, after washing, is dissolved in cuprammonium solution, and the cotton is determined by the viscosity method. C—9.

Cellulose: Dissolution in Organic Solvents. K. H. Meyer, M. Studer, and A. J. A. van der Wyk. *Sitzungsber. Öster. Akad. Wiss.*, 1950, 159, No. 1-2, pp. 151-154 (through *J. Soc. Dyers Col.*, 1950, 66, No. 12, p. 657). Differences of solubility of crystalline and amorphous celluloses prepared from a sulphite pulp, in pyridine-chloral as solvent, are found to be due to the influence of crystallinity and molecular weight. Solubility data are given for amorphous celluloses prepared from the sulphite pulp (Lintra cellulose) and from cotton, for a variety of solvents. The mechanism of dissolution is ascribed to either compound or addition-compound formation, and experiments which illustrate this are described. It is also found that amorphous cellulose from Lintra fibre dissolves to form highly viscous stable solutions in pyridine-lithium halide (chloride, bromide, or iodide), quinoline-lithium halide, and pyridine-calcium thiocyanate, whereas amorphous cellulose from cotton dissolves only in pyridine-lithium bromide and quinoline-calcium thiocyanate. In no case does unprecipitated native cellulose dissolve. The specific character of the effect of electrolytes indicates that a purely electrostatic theory is insufficient to explain the phenomena. C—9.

Egg Albumin: Effect of Pressure on the Denaturation. V. S. Tongur. *Colloid. J. U.S.S.R.*, 1949, 11, pp. 274-279 (through *Brit. Abstr.*, 1950, B III, July, p. 288). Using an apparatus from which pressures up to 8,000 atmospheres could be realised and with which the temperatures could be controlled to within ±0·2° C., experiments were carried out on the effect of pressure on denaturation both with and without heating. It was found that heat and applied pressure counteract each other, and that the coagulation of egg albumin by heat is retarded under pressures of less than 3,000 atmospheres. Under certain conditions denatured protein can be re-natured by the application of pressure. C—9.

Cotton Cellulose: Experiments on the Reduction of the Crystallinity. Leon Segal, Mary L. Nelson and Carl M. Conrad. *J. Phys. Colloid Chem.*, 1951, 55, No. 3, pp. 325-336. A study has been made of the action of certain swelling agents, such as trimethylbenzylammonium hydroxide (Triton B), and some of the lower primary alkylamines, in reducing the crystallinity of cotton cellulose. There are seventeen references. C—9.

Cellulose: Fractionation by Summative Method. Sydney Coppick, O. A. Battista and M. R. Lytton. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2533-2538. In order to minimise the chemical breakdown of cellulose chains when in solution, the authors have used a summative method for the fractionation of cellulose, and in this method the time of polymer-solvent contact is held to a minimum. Summative data are given and interpreted. The fractional analysis of the chain length distributions of various rayons and rayon pulps have been carried out by the summative method. Characteristic curves showing weight average differential distributions for these samples are shown. There are twenty-one references. C—9.

Cellulose: Heterogeneous Degradation. II. Mild Oxidative Degradation by Means of Sodium Toluenesulphonsodiochloroamide [Chloramine-T]. T. Kleinert and V. Möszmer. *Sitzungsber. Öster. Akad. Wiss.*, 1950, 159, (1-2), pp. 118-121 (through *J. Soc. Dyers Col.*, 1950, 66, No. 12, p. 657). A substance of 94·6 per cent. α-cellulose content, with a copper viscosity of 245, and an average degree of polymerisation (D.P.) as determined viscometrically of 785, has been degraded in very dilute chloroamine solutions over long periods of time (100-400 days). Decomposition occurred approximately linearly at D.P. 500, but was only slight at lower values. C—9.

Methyl Cellulose: Heterogeneous Hydrolysis. Richard E. Reeves and Laurence W. Mazzeno, Jr. *Text. Res. J.*, 1951, 21, No. 3, pp. 168-169. In a letter, the authors examine the results of Steele and Pacsu (*J. Textile Institute*, 1950, 41, A315) obtained in their investigation of the rate of hydrolysis of methyl cellulose, and consider their interpretation that the reaction proceeds in two stages —the first, the rapid hydrolysis of weak acetal linkages, and the second, the hydrolysis of the more stable glucopyranoside linkages. Finding that a series of temperature coefficients and apparent activation energies obtained from plots of rate constants against degrees of polymerization at 60° C. and 80° C. appear to be constant, the authors suggest the reaction is a single one. The slowing of the rate of hydrolysis may be due to the progressively decreasing area of exposed surface of the cellulose undergoing reaction. Comments by R. Steele and E. Pacsu, rejecting this interpretation, follow the letter; they give four references to previous work by Steele, Pacsu and Mehta. C—9.

Nitrocellulose: Hydrolytic Decomposition. J. F. v. Gizycki. *Chem. Ztg*, 1950, 4, pp. 211-214 (through *Chem. Abstr.*, 1951, 45, No. 10, p. 4443^{f}). The hydrolytic decomposition of nitrocellulose during boiling in water is considered. Analytical methods which might be used to measure the extent of hydrolysis are discussed and include viscosity determination, Methylene Blue adsorption and alcohol extraction. C—9.

Polystyrene: Intrinsic Viscosity Relationships. T. G. Fox, Jr., and P. J. Flory. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 1915-1920. Intrinsic viscosities of polystyrene fractions ($M = 7{\cdot}0 \times 10^4$ to $1{\cdot}27 \times 10^6$) have been determined in various solvents at several temperatures. Critical miscibility temperatures θ in the limit of infinite molecular weight were found to be 307 and 343°K. for polystyrene in cyclohexane and in ethylcyclohexane, respectively. From intrinsic viscosities measured in these solvents at temperatures equal to their respective θ's, K in the equation $[\eta] = KM^{\frac{1}{2}}\alpha^3$ was found to be about $8{\cdot}0 \times 10^{-4}$ at 34° C. and about $7{\cdot}3 \times 10^{-4}$ at 70° C. Present data, as well as other data from the literature, are found to be well represented by the above quotation in conjunction with the relationship $\alpha^5 - \alpha^3 = 2\psi_1 C_M(1 - \theta/T)M^{\frac{1}{2}}$, where α is the factor representing the linear expansion of the polymer coil due to interactions. The entropy of dilution parameter ψ_1 been found to be about 0·1 for the solvents with cyclic structures; ψ_1 for methyl ethyl ketone is about 0·01. The universal viscosity constant Φ in the relationship $K = \Phi(\overline{r_0^2}/M)^{3}/_{2}$ has been calculated to be $2{\cdot}1 \times 10^{21}$ on the basis of data of Outer, Carr and Zimm on molecular dimensions of polystyrene in

solution as deduced from the dissymmetry of scattered light. The root-mean-square distance $\sqrt{r_0^2}$ separating the ends of a polystyrene chain in the absence of interactions of the polymer segments with their environment, apart from hindrances to free rotation, is calculated to be 730 A at 25° C. for a polystyrene of $M = 10^6$; the calculated distance for free rotation is 302 A. In benzene, a good solvent, at 25° C., $\alpha \cong 1 \cdot 5$ and the root-mean-square distance between the ends of the chain is *ca.* 1100 A. The polystyrene molecule appears to be more extended than is one of polyisobutylene having the same number of chain atoms. C—9.

Polyisobutylene in Various Solvents: Intrinsic-Viscosity/Temperature Relationship. T. G. Fox, Jr., and P. J. Flory. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 1909-1915. Intrinsic viscosities of polyisobutylene fractions ($M = 1 \cdot 8 \times 10^5$ to $1 \cdot 88 \times 10^6$) have been determined in various pure solvents, and in several solvent mixtures also, over wide temperature ranges The measurements have been corrected to zero rate of shear in addition to the usual extrapolation to infinite dilution. The results provide a rigorous test of the recent theory relating the intrinsic viscosity to polymer-chain structure and to thermodynamic parameters governing the interaction between polymer and solvent. The theory is found to apply quantitatively within the limit of the experimental error in the results. There are seventeen references. C—9.

Ion Exchange in Alkali Cellulose. Olof Samuelson, Fred Gärtner and Georg Johansson. *Svensk Kem. Tid.*, 1950, 62, pp. 211-214. In English. (Through *Chem. Abstr.*, 1951, 45, No. 10, p. 4443[d]). It is shown by ion-exchange experiments using radioactive sodium that any difference in reaction velocity between those sodium ions which are bound in the amorphous parts of the cellulose, and those bound in the crystallites, is too small to be detected; that is, ion exchange takes place with very great velocity even in the crystallites. C—9.

Cellulose Molecules and of Cellulose Obtained from Plant Fibre: Long-Period Structure. G. V. Schulz and E. Husemann. *Z. Naturf.*, 1946, 1, pp. 268-280 (through *Brit. Abstr.*, 1950, **A1**, July, p. 408). Research on the molecular structure of cellulose has revealed that a weaker linkage between the constituent glucose units occurs about every 500 units. Artificial fibres do not possess this periodicity. The complete molecules consist of about 3,200 units. C—9.

Aqueous Soap Solutions: Mechanism of Hydrolysis. Melvin A. Cook. *J. Phys. Colloid Chem.*, 1951, 55, No. 3, pp. 383-402. An interpretation is made of the curves of Powney and Jordan (*Trans. Faraday Soc.*, 1938, 34, p. 363; see *J. Textile Institute*, 1938, 29, A304) for the degree of hydrolysis against soap concentration. It is suggested that the observed maxima and minima are due to small free acid and anion (submicelle) particles in which not the solution but the surface equilibria are involved in determining the concentration above surface saturation. A model is developed to explain the hydrolysis behaviour and the model is applied quantitatively for sodium palmitate, sodium oleate and sodium myristate. The results are found to be in good agreement with observation, not only in reproducing the experimental hydrolysis curves, but in obtaining their temperature coefficients. There are six references. C—9.

Cellulose: Modifications. A. Sippel. *Kolloid Z.*, 1950, 119, No. 1, pp. 42-45. In German. Various possible forms of the cellulose molecule are discussed and considered with the aid of Stuart models. As a result of these considerations, a stress-free "vessel"-shaped cellulose molecule is postulated, composed of periods of two basic molecules—that is, cellobiose units—these periods having a length of about 9·8 A. This form provides a good explanation of the restricted extensibility of cellulose fibres. C—9.

Starch Solutions: Properties. A. Engblom. *Festskr. J. A. Hedvall*, 1948, pp. 135-148 ((through *Brit. Abstr.*, 1950, **B III**, November, p. 463). The influence of cooking time and inorganic salt content on the viscosity of potato starch solutions was investigated using a torsion viscometer. Viscosity is diminished by the presence of salts, particularly phosphates; the starches used for the preparation of sizes in the textile industry should therefore have a high salt content. The time of cooking of size at 95° C. is of significance only when starches of low salt content are being used. Removal of excess starch from the fibre is best achieved by the use of enzymes, as chemical methods are liable to damage cellulose fibres. C—9.

Carbohydrates: Reactions with Nitrogenous Substances. I. Mutarotations of Some Glycosylamines. Ward Pigman, E. A. Cleveland, D. H. Couch, and J. H. Cleveland. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 1976-1979. The hydrolysis or isomerisation of several glycosylamines in aqueous solutions at 30° C. was followed by mutarotation measurements and determination of the amount of free amine present. The stability and type of reaction are found to be dependent upon the nature of the aglycon group and the acidity of the solution. There is evidence for three types of reactions: hydrolysis; reaction A (presumably isomerisation); and reaction B, which occurs in glacial acetic acid. A number of new compounds were prepared. There are thirteen references. C—9.

Cellulose: Separation into Molecules and Larger Particles during Esterification. R. Signer, A. Aeby, F. Opderbeck and H. Studer. *Sitzungsber. Öster. Akad. Wiss.*, 1950, 159, (1-2), pp. 232-238 (through *J. Soc. Dyers Col.*, 1950, 66, No. 12, p. 659). It is shown by means of the electron microscope, the ultracentrifuge, and double refraction data, that many cellulose esters of organic acids contain easily orientable macroparticles alongside chain molecules. The former can be concentrated by fractionation, identified from the sedimentation diagram, and rendered visible by the ultramicroscope. There are six illustrations. C—9.

Solutions of High Polymers. C. E. H. Bawn. *Annual Reports of the Progress of Chemistry*, 1950, 47, pp. 85-97. This is a review of the literature. There are eighty-one references. (*J. Textile Institute*, 1951, 42, A577.) C—9.

Proteins and Polymers: Sorption of Water Vapor. IV. Bernard Katchman and A. D. McLaren. *J. Amer. Chem. Soc.*, 1951, 73, No. 5, pp. 2124-2127. The water vapour sorption isotherms of a number of polymers and proteins have been acquired in an effort to determine the relative efficiency of site adsorption of polar groups. Unlike many proteins, the first sorbed water apparently does not penetrate the tobacco mosaic virus particles. Crystalline insulin and soya-bean trypsin inhibitor absorb more water than the corresponding amorphous samples. The sorption capacity of polar groups (ether, hydroxyl) can depend on the structure of the polymer. Ester linkages have very little affinity for water vapour. The carboxyl group, like the hydroxyl group, has a strong affinity for water. The over-all results indicate that a one-to-one correlation of polar groups and sorbed water molecules in proteins and polymers is generally not observed, as structural relationships tend to limit sorption. There are eighteen references. C—9.

Synthetic Lubricant Development: Structural Guides. C. M. Murphy and W. A. Zisman. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2415-2420. The authors discuss the relationship in synthetic lubricants of molecular structure to such properties as small temperature coefficients of viscosity, freezing-point depression, and boundary lubricant and rust-inhibition properties. Special reference is made to the properties of hydrocarbons, ethers, polyethers, thio-ethers, mono-, di-, tri-, and tetra-esters, silicones, perhalocarbons and amides. There are forty-three references. C—9.

Polymethylphenylsiloxanes: Thermal and Oxidation Stability. C. M. Murphy, C. E. Saunders and D. C. Smith. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2462-2468. Results of an investigation on the thermal and oxidation stability of polymethylphenylsiloxanes are reported and compared with the corresponding stability of polymethylsiloxanes. There are thirty-seven references. C—9.

Macromolecular Solutions: Viscosity and Molecular Weight. H. Mark. *Sitzungsber. Öster. Akad. Wiss.*, 1950, 159, (1-2), pp. 140-151 (through *J. Soc. Dyers Col.*, 1950, 66, No. 12, p. 659). The viscosity number A and the molecular weight M of macromolecular substances are found to be related by the general equation $A = KM^a$, where K and a depend on the temperature and nature of the solvent. A theoretical analysis of the viscosity number is given, and data for the following solutions at 25° C. are included—cellulose in cuprammonium solution ($K = 0{\cdot}85 \times 10^{-4}$ and $a = 0{\cdot}81$), cellulose acetate in acetone (1·49 and 0·82), and cellulose acetate-butyrate in acetone (1·37 and 0·83). C—9.

The Viscosity of Suspensions of Spheres. II. The Effect of Sphere Diameter. James V. Robinson. *J. Phys. Colloid Chem.*, 1951, 55, No. 3, pp. 455-464. The effect of the size of small glass spheres upon the viscosity of their suspensions has

been studied, employing for the analysis of the results an equation previously derived. It is shown that a decrease in the size of the spheres increases their relative volume, measured indirectly by viscosity and directly in a packed sediment, and that the increase in relative volume is caused by interaction of the spheres with the suspension medium. (*J. Textile Institute*, 1950, **41**, A153.) C—9.

Macromolecular Solutions: Abnormal Viscosity. I. Analysis of the Abnormal Viscosity. Ikumi Kagawa. *J. Chem. Soc. Japan*, Pure Chem. Sect., 1949, **70**, pp. 278-281 (through *Chem. Abstr.*, 1951, **45**, No. 7, p. 2747[f]). It is postulated that the abnormality in the viscosity phenomena of macromolecular solutions is wholly due to the appearance of a flow state which has potential energy corresponding to the velocity gradient, so that the total flow resistance is separated into two terms—a so-called viscosity resistance, and a flow plasticity potential caused by the relaxation of the potential energy state. A new designation, "state viscosity", is suggested in place of the so-called structural viscosity. A new empirical formula is given which agrees well with the data given by Staudinger and Sorkin (see *J. Textile Institute*, 1939, **28**, A731) on the abnormal viscosity of nitrocellulose solution. C—9.

Pectin: Alkaline Degradation. B. Vollmer. *Mikromol. Chem.*, 1950, **5**, No. 2, pp. 110-127. In German. Osmometric molecular-weight determinations show that alkaline hydrolysis of pectin is accompanied by considerable depolymerisation even when the reaction is carried out in an atmosphere of pure nitrogen. Depolymerisation is complete at the conclusion of hydrolysis. Pectic acid resists attack by sodium hydroxide. Pectic acid methyl-ester, as prepared by the diazomethane or methanol-hydrochloric-acid reaction, is depolymerised by sodium hydroxide in much the same manner as pectin prepared in the usual way. This, and another series of experiments, show that the alkaline depolymerisation of pectin solutions is only possible in the presence of methoxy groups, and that the degree of polymerisation is a function of the methoxy content, that is, of the degree of esterification. It is assumed that the acetate linkage of galacturonic acid is split under the influence of the ester carbonyl group. C—9.

Cellulose: Alteration of the Crystal Lattice by Water. H. Kiessig. *Z. Electrochem.*, 1950, **54**, pp. 320-325 (through *Chem. Abstr.*, 1950, **44**, No. 21, p. 10314[b]). The unit cell dimensions of cellulose in the form of ramie fibre, mercerized ramie, spun viscose, and regenerated acetate rayon fibres, were determined for the dry and wet materials. Only 0·17 of a molecule of water is taken up per $C_6H_{10}O_5$ unit in the case of mercerised ramie, spun viscose and regenerated acetate rayon fibres; this water is considered to be statistically distributed, rather than filling specific sites as in a stoichiometric compound. C—9.

Apparatus to Deliver Liquid at Constant Rate. J. H. E. Herbst. *Canad. J. Res.*, 1951, **28**, B, No. 11, p. 752. An apparatus is described which delivers liquids at a constant predetermined rate, and which is capable of operating without attention. The apparatus was found useful in various washing operations and in dialysis, and was used without failure for eighteen months. C—9.

Perlon: Calculation of Degree of Polymerisation from Viscosimetric Data. Arno Matthes. *Makromol. Chem.*, 1950, **5**, No. 2, pp. 165-178. In German. Using viscosimetric methods to follow the course of hydrolysis of Perlon in a homogeneous medium, it is found that the reaction coefficient shows a marked inconsistency if intrinsic viscosity is assumed to be directly proportional to degree of polymerisation. Consistent values are obtained, however, by using the linear expression $P = 124[\eta] - 5$. This formula has presumably to be regarded as a sufficient approximation to a slightly curved line originating from the zero point. C—9.

Cellulose: Calculation of the Molecular Weight from the Viscosity of Its Cuprammonium Solutions. V. I. Ivanov, O. P. Golova, and B. A. Zakharov. *Izvest. Akad. Nauk S.S.S.R., Otdel Khim. Nauk*, 1950, pp. 408-411 (through *Chem. Abstr.*, 1951, **45**, No. 9, p. 4038[b]). The authors discuss the interpretation of viscometric data for cellulose, using data of Schulz, *et al.* (*Z. physik. Chem.*, 1942, **B52**, pp. 23-49) and of Golova and Ivanov (*Bull. acad. sci. U.R.S.S. Classe sci. chim.*, 1945, pp. 279-281). C—9.

Cellulose Fibres. 14. Distribution of Xanthate Groups in Heterogeneously Xanthated Cellulose. K. Lauer. *Makromol. Chem.*, 1951, **5**, No. 3, pp. 287-291. In German. Xanthation in the heterogeneous phase, up to γ values of 50, gives

rise to substitution in the 2-position so that only 50 per cent. of the glucose residues can have reacted. Xanthation to γ values of 75-80 gives substitution in the 3-position of the same residues as before, so that again only 50 per cent. have reacted. C—9.

Xylan and Cellulose: Comparison of Esterification Conditions and Properties. A. A. Konkin and Z. A. Rogovin. *Zhur. Priklad. Khim.* (J. Applied Chem.), 1950, 23, pp. 536-544 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10315[i]). Specimens of xylan were prepared, and such properties as solubility in dilute alkalis, and ease of nitration, acetylation and oxidation, were compared with those of cellulose. C—9.

Cupro-ammoniacal Solutions of Cellulose. 1. The Effect of Ammonia and Alcohol on the Rotation of the Plane of Polarization of Cupro-ammoniacal Solutions of Cellulose. M. I. Arkhipov and V. P. Kharitonova. *Zhur. Priklad. Khim.* (J. Applied Chem.), 1949, 22, pp. 761-770 (through *Chem. Abstr.*, 1951, 45, No. 12, p. 5402[i]). A study was made of the changes of the angle of rotation of the plane of polarisation in a cuprammonium solution of cellulose when the concentrations of ammonia, copper and cellulose are varied and when ethyl alcohol is added. Similar observations were made on a cuprammonium solution of sucrose. C—9.

Carboxymethylcellulose: Determination of the Degree of Substitution over the Entire Substitution Range. R. R. McLaughlin and J. H. E. Herbst. *Canad. J. Res.*, 1951, 28, B, No. 11, pp. 737-744. The published methods for the determination of the degree of substitution of carboxymethylcellulose were found to be unsatisfactory for samples of high degree of substitution. Two methods were developed: one comprises the removal of the impurities from crude sodium carboxymethylcellulose by dialysis or washing with ethanol, and determination of the sodium content; the other is precipitation of cupric carboxymethylcellulose under controlled conditions, purification, and determination of the copper content. C—9.

Diethyl Chlorophosphite as a Reagent for Peptide Syntheses. George W. Anderson, Alice D. Welcher and Richard W. Young. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 501-502. Diethyl chlorophosphite is found to be a unique reagent which forms both reactive amides and anhydrides, thus allowing the addition of amino-acid units to either end of a peptide chain. Methods of preparation are briefly indicated. C—9.

Chlorine and Chlorine Dioxide Bleaching: Effect on the Copper Number, Hot-Alkali Solubility, and Carboxyl Content of Sulphite Cellulose. Olof Samuelson and Curt Ramsel. *Svensk Papperstidn.*, 1950, 53, pp. 155-163. In English. (Through *Chem. Abstr.*, 1951, 45, No. 1, p. 348[d]). The effect of *pH* in bleaching sulphite pulp with chlorine was studied on a laboratory scale, and measured (1) by copper number, (2) by hot-alkali solubility, and (3) by carboxyl content. Bleaching experiments were also made using chlorine dioxide in acid medium on pulps previously treated with chlorine in acid and alkaline medium. There are twenty-four references. C—9.

***pH*: Effect on the Colour of Internally Complex and Cyclic Salts.** V. I. Kuznetsov. *Zhur. Obshchei Khim.* (J. Gen. Chem.), 1950, 20, pp. 816-830 (through *Chem. Abstr.*, 1951, 45, No. 4, p. 1453[b]). C—9.

Linear Polymers: The Effect of Structure on the Fiber Properties. I. The Orientation of Side Chains. James H. Brewster. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 366-370. The author discusses the theory of the influence, on polymer properties, of the stereo-chemical orientation of side-chains. Side chains appear to interfere with the formation of strong oriented fibres, but when they form a regular recurrent pattern, the polymers are more crystalline than isomeric polymers having irregularly distributed side-chains. Polyurethans were prepared having (*a*) no side-chains, (*b*) only paired, regularly spaced side-chains, and (*c*) unpaired, regularly spaced side-chains. The first two were crystalline and formed oriented fibres, while the latter was a viscous liquid. Nylon analogues—the polyamides of hexamethylene-diamine, and *meso-*, *d-*, and *dl*-α,α'-dimethyl-adipic acid—were prepared, and all formed oriented fibres, though of weaker tensile strength than the parent nylon. All the "dimethyl nylons" appeared to suffer a slow reversion from the oriented to the unoriented state. The "dimethyl

nylons" underwent a secondary, rapidly reversible, cold-drawing, when subjected to stress greater than that required for primary cold-drawing. The fibres in this new state were opaque, lustreless, and inclined to break easily. C—9.

High Polymers: Effect of Supersonics. VI. Effect of Supersonics on Viscose. Hiroshi Sobue and Kinzo Ishikawa. *J. Chem. Soc. Japan*, Pure Chem. Sect., 1950, 71, pp. 103-105 (through *Chem. Abstr.*, 1951, 45, No. 11, p. 4528[e]). The changes of viscosity, of polymerisation degrees, and of γ-values of viscose, caused by supersonic irradiation (560 kc.), were determined in various concentrations. C—9.

Glycols: Effects of Position Isomerism on the Physical Properties. K. A. Clendenning, F. J. Macdonald, and D. E. Wright. *Canad. J. Res.*, 1950, 28, B, No. 10, pp. 608-622. Data on specific gravity, refractivity, viscosity, boiling point, and freezing point, are provided for 1,2-propanediol, 1,3-propanediol, 1,2-butanediol, 1,3-butanediol, 1,4-butanediol, 1,2-pentanediol and 1,5-pentanediol, in the pure state, and in aqueous solution. Lengthening the distance between the hydroxyl substituents is found to increase the specific gravity, refractivity, and viscosity, and raise the boiling point; it reduces thermal expansion and isothermal contraction on mixing with water. The glycols are arranged in order of their effectiveness as freezing-point depressants. Aqueous solutions of the glycols exhibit pronounced specific gravity maxima, and the glycol concentration at which maximum specific gravity is attained is found to increase with increasing distance between the hydroxyl substituents. C—9.

Electrical Osmosis. Luc Henry Collet. *Pub. Sci. et Tech. Ministère Air, Notes Tech.*, 1950, No. 34, 62 pp. (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9773[h]). Experiments on electro-osmosis are described; the results appear to contradict the double-layer theory of Helmholtz. A considerable decrease in current flow occurring during electrolysis was attributed to a "blocking" effect. The membrane became polarised by ions which got trapped in its pores and were held there by a difference in potential. An apparatus to measure the static electro-osmotic pressure is described. C—9.

Sodium Carboxymethyl Cellulose and Dissociation of CMC: Electroviscous Effect in the Preparation of Solutions. T. Hekker. *Chem. Weekbl.*, 1950, 46, pp. 625-629 (through *Brit. Abstr.*, 1951, **B II**, January, p. 73). The author has studied the effect on the viscosity of sodium carboxymethyl cellulose solutions of adding electrolytes (acids and salts), and the change of the dissociation constant on adding hydrochloric acid. Hermans and Overbeek's theory of the electroviscous effect with polymeric electrolytes was applied in the tests. C—9.

Viscosity Data: Empirical Analysis. H. Tracy Hall and Raymond M. Fuoss. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 265-269. The equation for the determination of viscosity of a liquid running through a capillary viscometer under pressure, corrected for kinetic energy and end effects by Wilberforce, has been rearranged to an equation in which apparent fluidity is linear in driving pressure. An additional term, also linear in pressure, is produced by drainage errors. A method is described for the experimental evaluation of these corrections. Polystyrene and polyvinylpyridine solutions exhibit a fluidity which varies linearly with pressure after the above corrections have been made. Analysis of the data permits description of the shear dependence in terms of a single arbitrary constant k, the shear constant. At a pressure p, the intrinsic viscosity of a polymer is said to be $[\eta]_\infty (1-kp)$. There are ten references. C—9.

Diffusion and Sedimentation Measurements: Evaluation. G. Meyerhoff. *Makromol. Chem.*, 1950, 5, No. 2, pp. 161-164. In German. Lamm's refractometric scale-method is nearly ideal for diffusion and sedimentation measurements on most substances. However, the evaluation of photographic plates by means of a comparator is needlessly time-consuming, and can be speeded up by using an enlarging camera. C—9.

Fibrous Celluloses. IX. Heterogeneous Degradation of Cellulose. II. Mild Oxidative Degradation by means of Sodium Toluenesulfonylchloroamide. Th. Kleinert and V. Mössmer. *Monatsh.*, 1950, 81, pp. 118-121 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10315[d]). The oxygen consumption and the changes in degree of polymerisation (D.P.) were followed in a rayon pulp which consisted of 94·6 per cent. α-cellulose with a D.P. of 785, and which was treated with very dilute sodium toluene-sulphonyl-chloroamide at 20° C., with the exclusion of light, for 355 days. C—9.

Cellulose Fibers: Fine Structure. III. [Effect of Steaming on Viscose Fibers]. Isao Okamura, Shoichi Sakajiri and Megumu Fujikama. *Teijin Times*, 1951, 21, No. 3, pp. 3-10. In English. (Through *Chem. Abstr.*, 1951, 45, No. 12, p. 5404[a]). Hydrated (regenerated) viscose fibres, in a metastable state, and containing various amounts of water, were stabilised by heating in saturated or superheated steam (to prevent oxidation). In hydrated cellulose (heated at 150°-175° C.) the crystalline region was found to increase and the rate of hydrolysis to decrease. Hydrated cellulose could be converted to natural cellulose by heating for one hour at 250° C. in glycerol. C—9.

Hemicelluloses of Wheat Straw. G. A. Adams and A. E. Castagne. *Canad. J. Chem.*, 1951, 29, No. 2, pp. 109-122. Hemicelluiose fractions were extracted from wheat-straw holocellulose, and the original holocellulose, the extracted residue and the recovered fractions were analysed for pentosan, uronic acid anhydride, acetyl, methoxyl, and ash content. All fractions were found to have a degree of polymerisation of 25-30 from intrinsic viscosity measurements. On hydrolysis, the main fraction yielded D-xylose, L-arabinose and D-glucose; in addition D-galactose was found in the water-soluble fractions. On hydrolysis all fractions yielded an acid-resistant uronic acid complex that contained D-xylose, and a uronic acid tentatively identified as monomethoxyl galacturonic acid. There are twenty-nine references. C—9.

Cellulose: Heterogeneous Degradation. I. Preliminary Communication: Hydrolytic Degradation. Th. Kleinert and V. Mössmer. *Monatsh.*, 1948, 79, pp. 442-443; *Österr. Akad. Wiss., Math.-naturw. Klasse, Sitzber. Abt.* IIb, 1948, 157, *Tl.* 2, No. 2, pp. 442-443; *Österr. Chem. Ztg.*, 1948, 49, p. 84 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 10314[i]). Changes in the degree of polymerisation, and in the dry and wet tensile strength, were studied (1) in samples of raw cotton subjected to a very gradual hydrolysis with 0·1 N hydrochloric acid at 20° C. with exclusion of light, and (2) in samples similarly hydrolysed in the presence of 2 g. per litre of Igepon, an active wetting agent. C—9.

Acetic Anhydride: Hydrolysis in Water and in the System Water: Methyl-Ethyl-Ketone. E. N. Banks, A. E. Marshall, R. W. Vollett and R. R. McLaughlin. *Canad. J. Res.*, 1950, 28, B, No. 11, pp. 663-670. The rate of hydrolysis of acetic anhydride at 25° C. (1) in water, (2) in solutions of methyl ethyl-ketone in water, and (3) in solutions of water in methyl-ethyl-ketone, have been studied. C—9.

Internal Dissociation, Colour, and Chemical Activity of Inner-complex and Cyclic Salts. V. I. Kuznetsov. *Zhur. Obshcheĭ Khim.* (J. Gen. Chem.), 1950, 20, pp. 807-815 (through *Chem. Abstr.*, 1951, 45, No. 4, p. 1452[f]). C—9.

β-Alanine in Water and Isopropyl-Water Mixtures: Ionisation Constants. Margie May and W. A. Felsing. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 406-409. From electromotive force measurements on cells without liquid junction, the acid ionisation constants of β-alanine have been determined in 0, 5, 10, and 20 weight-per-cent. isopropyl alcohol, in water, from 0° to 40° C. The basic ionisation constants were determined in water by the same method. The ionisation constants have been expressed as functions of temperature by equations of the form $-\log K = A/T + CT - D$. C—9.

Glycine: Ionisation and the Effect of Sodium Chloride upon its Second Ionisation. Edward J. King. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 155-159. The thermodynamic ionisation constants, K_1 and K_2, of glycine, have been redetermined at 5° intervals from 10° to 50° C. The effect of sodium chloride upon the second ionisation of glycine,* $k_2 = [m_H m_G / m_Z]_0 M$, has been determined from the electromotive forces of hydrogen/silver-chloride cells containing glycine/sodium-glycinate/sodium-chloride buffers at 5° intervals from 5° to 55° C., and at constant ionic strengths of 0·1 and 0·3 molal. Equations for computing $-\log K_1$, $-\log K_2$ and $-k_2$ as functions of the temperature are given. From them, the derived thermodynamic quantities $\Delta F°$, $\Delta H°$, $\Delta C°_p$, and $\Delta S°$ associated with the two ionisation reactions, as well as † $[\log \gamma_H \gamma_G / \gamma_Z]_1 M$, $[\log \gamma_{OH} \gamma_Z / \gamma_G a_{H_2O}]_1 M$, and $[-\log m_H]_0 M$ at the isoelectric point, have been calculated and discussed. There are nineteen references.

*m_G and m_Z are the concentrations of glycinate ion and glycine respectively in moles per kg of solvent.
† activity coefficient functions. C—9

Periodic Acid: Ionisation and Hydration Equilibria. C. E. Crouthamel, A. M. Hayes and D. S. Martin. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 82-87. Variations in the absorption characteristics of periodate solutions, with *pH* and temperature, have been used to determine the species present in dilute aqueous solutions. The species H_5IO_6, $H_4IO_6^-$, IO_4^- and $H_3IO_6^=$ and their equilibria, were sufficient to explain the spectrophotometric and potentiometric data of periodate solutions in *pH* ranges 0-7 and temperature ranges 0-70° C. Apparent and true constants for these ionisation and hydration equilibria have been evaluated at 25° C. There are fourteen references. C—9.

Kinetic Studies on Carbohydrates in Alkaline Conditions. 1. The Kinetics of the Autoxidation of Glucose. C. H. Bamford and J. R. Collins. *Proc. Roy. Soc.*, 1950, Series A, **204**, November, pp. 62-84. The kinetics of the autoxidation, interconversion and degradation reactions of glucose are examined, with the object of developing a single scheme incorporating all these processes in a quantitative manner. Results of experiments undertaken allow the drawing up of a complete reaction scheme in which the velocity constants of most of the reactions can be calculated. C—9.

Kinetic Studies on Carbohydrates in Alkaline Conditions. 2. The Kinetics of the Rearrangements of Glucose and Fructose in Alkaline Solution. C. H. Bamford, Daphne Bamford and J. R. Collins. *Proc. Roy. Soc.*, 1950, Series A, **204**, November, pp. 85-98. In this kinetic study of the degradation and interconversion of glucose and fructose in alkaline solution, the change in sugar concentration has been followed by means of electrometric titration of lactic and saccharinic acid, which are the main products of the degradation in the range of alkali concentration used. A kinetic analysis of the results indicates that all the reactions which occur are of first order with respect to the sugar concentration. In a general discussion of parts 1 and 2 of this series, it is shown that the observed dependence of the rates of the degradation and interconversion reactions of glucose, upon the sugar and alkali concentration, can be explained in terms of the ionic intermediates postulated for the autoxidation reaction. These intermediates are thought to be concerned in the rate-determining steps of the reactions in the range of alkali concentration used. The absolute velocity constants of most of the reactions have been calculated on this basis. The structure of the intermediates and the mechanism of the reactions are discussed. C—9.

Hydrogen Sulphide: Liberation by X-Radiation from Cysteine and Glutathione. W. M. Dale and J. V. Davies. *Biochem. J.*, 1951, 48, No. 2, pp. 129-132. Experiments are described on the production of hydrogen sulphide by X-radiation from cysteine and glutathione. The influence of *pH*, oxygen, hydrogen, peroxide, concentration of solute, *etc.*, on the process, has been studied. There are twenty-two references. C—9.

Cellulose Fibres: Measurement and Significance of Swelling. W. Gallay. *Pulp Pap.* [*Mag.*] *Can.*, 1950, **51**, No. 10, pp. 115-119 (through *Brit. Abstr.*, 1951, B II, January, p. 74). Methods, and results, of measurement of the swelling of cellulose fibres in water, are reviewed and compared, and the significance of swelling of cellulose fibres in pulp preparation and paper properties is discussed. C—9.

High Polymers: Method of Fractionation. O. Fuchs. *Makromol. Chem.*, 1951, 5, No. 3, pp. 245-256. In German. In this method of fractionating high polymers, a very thin film of the substance to be tested is dissolved step by step in solvent/non-solvent mixtures of changing composition. The method is rapid, and is recommended for series tests. The amount of substance required is 500-1,000 mg. Distribution curves are given for polyvinyl acetate, polyvinyl alcohol, and polyvinyl chloride. In addition, it is shown that there is a linear relation between the specific viscosity, η_{sp}, for a concentration of 10 g. per litre, and M, the molecular weight of a fractionated polyvinyl acetate. C—9.

Amylopectin: Molecular Magnitude. Ralph W. Kerr, F. C. Cleveland and W. J. Katzbeck. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 111-117. The molecular weight and the molecular size of corn and tapioca amylopectins were found by four different methods, and the results compared. There are nineteen references. C—9.

Serine: A Note on the Racemization. J. C. Crawhall and D. F. Elliott. *Biochem. J.*, 1951, 48, No. 2, pp. 237-238. Contrary to the views of Daft and

Coghill (1931), serine was found not to be racemized at *pH* 9 at room temperature, or by excess of N sodium hydroxide at room temperature. The authors find serine to be racemized at 105° C. and *pH* 11·4, whereas alanine was unchanged at *pH* 13·4 and 105° C. C—9.

Pectin and Pectic Acid: Complete Methylation with Diazomethane, and the Use of Completely Esterified Pectin Derivatives for Uronic Acid Determination and for Molecular Weight Determination. B. Vollmert. *Makromol. Chem.*, 1950, 5, No. 2, pp. 101-109. In German. The quantitative esterification of pectin and pectic acid with diazomethane is described. It is shown that the reaction does not cause depolymerisation if the reaction temperature is below −50° C. The esterification allows the making of viscosimetric molecular-weight determinations in aqueous solution. Accurate determination of the uronic acid content of pectins thus esterified can be made by the Zeisel method. C—9.

Cellulose Products: Ratio of Molecular Weights Calculated from Viscosity and from the Rates of Sedimentation and Diffusion. V. I. Ivanov and B. A. Zakharov. *Doklady Akad. Nauk S.S.S.R.*, 1950, 72, pp. 1063-1065 (through *Chem. Abstr.*, 1951, 45, No. 9, p. 4038[i]). The ratio between the molecular weight determined from viscometric data on the one hand, and that determined from sedimentation-diffusion data on the other, has been obtained for thirteen cuprammonium cellulose products. An equation $M_{sed} = 1 \cdot 97[\eta]^{0.333}M_{vis}$ has been derived which expresses the relationship between these two molecular weights. C—9.

Cellulose: Reaction with Ammoniacal and Alkaline Solution of Metallic Hydroxides. A. Pakshver, M. Arkipov, and B. Geller. *J. Applied Chem. U.S.S.R.*, 1950, 23, pp. 187-96 (Engl. translation); *Zhur. Priklad. Khim.*, 1950, 23, pp. 181-191 (through *Chem. Abstr.*, 1951, 45, No. 11, p. 4921[e]). Results are given which show the power of cellulose to absorb different metallic hydroxides from alkaline and ammoniacal solutions. A new method of determining cobalt is described. C—9.

Nitrocelluloses: Relation Between Viscosity Number and Molecular Weight. Arnold Münster. *Naturwissenschaften*, 1950, 37, p. 375 (through *Chem. Abstr.*, 1951, 45, No. 6, p. 2288[d]). The relation between molecular weight and viscosity has been determined for solutions of nitrocellulose in acetone. The Staudinger equation is followed only for fractions having a degree of polymerisation of about 500. For higher molecular weight fractions a modified equation holds. C—9.

Legumin: Solubility and Gelation in Mixed Solvents. B. Jirgensons. *Makromol. Chem.*, 1950, 5, No. 2, pp. 139-147. In English. The author investigated the solubility and gelation of legumin (obtained from horse beans—a variety of broad bean—green peas, and vetches) in various mixed solvents. Details of the results are given. C—9.

Cellulose: Solubility in a 10 per cent. Solution of Caustic Soda. A. Pakshver and S. Florov. *J. Appl. Chem. (U.S.S.R.)*, 1950, 23, May. pp. 530-535 (through *J. Soc. Dyers Col.*, 1950, 66, No. 10, p. 563). The solubility of regenerated cellulose (viscose or cuprammonium rayon) in a 10 per cent. solution of caustic soda, is found to vary considerably according to the physical condition of the preparation. Wet viscose fibre is more soluble than the dry fibre, while tension of the fibre reduces its solubility. Solubility is considered to depend on the strength of the intermolecular linking. Factors, such as drying and treatment with electrolytes, which tend to increase the cross-linking, reduce its solubility in 10 per cent. caustic solution. C—9.

Hydroxides of Copper, Zinc, Nickel, and Cobalt: Solubilities in Solutions of Caustic Soda and Ammonia. [Dissolution of Cellulose in Alkaline Solutions of Metal Hydroxides]. M. I. Arkhipov, A. B. Pakshver and N. I. Podbornova. *J. Appl. Chem. (U.S.S.R.)*, 1950, 23, June, 650-656 (through *J. Soc. Dyers Col.*, 1950, 66, No. 10, p. 563). A study has been made of the two main factors favouring the dissolution of cellulose in alkaline solutions of metal hydroxides. (1) The first is the formation of a complex compound between the metal hydroxide, and sodium hydroxide or ammonia, and the solubility of this compound. The solubility of the metal hydroxide in the alkaline solution was taken as a measure of this factor. (2) The second factor is the instability of this compound when brought under the influence of the hydroxyl groups of cellulose. These two properties were measured for solutions of several metallic hydroxides. C—9.

Chain Molecules: Statistical Theory. H. Hadwiger. *Makromol. Chem.*, 1950, 5, No. 2, pp. 148-160. In German. The statistical problem of the most probable form of a chain molecule is discussed. An equilateral polygon is chosen as a model, and an attempt is made to express the fact that the possible configurations are influenced by the mutual obstruction of the component parts of the polygon. The most probable form of the chain molecule is more less curl-like. C—9.

Synthetic Polyamides. XV, XVI. Fractionation of Amilan [Polyamide Fibre]. Kohei Hoshino and Masamoto Watanabe. *J. Chem. Soc. Japan*, Pure Chem. Sect., 1949, 70, pp. 24-27; 27-30 (through *Chem. Abstr.*, 1951, 45, No. 7, p. 2747[i]). **XV.** The phase diagram of the ternary system Amilan-phenol-water has been determined, and used in the fractionation of the mixture at 70° C. The viscosity of fractions was measured and the number-average molecular weight obtained. The viscosity of Amilan of various degrees of polymerisation has also been determined. **XVI.** From the data on the above fractions the inhomogeneity of Amilan is discussed with reference to the number-average, weight-average, and viscosity-average molecular weights. A mechanism is proposed for the polymerisation of Amilan based on the distribution of molecular weights. C—9.

Viscosity: Theories Applied to Ionic Liquids. B. S. Harrap and (the late) E. Heymann. *Chem. Rev.*, 1951, 48, No. 1, pp. 45-67. In this review the authors consider relations between the viscosity and specific volume of liquids, and relations between viscosity and temperature. Headings under the former are: (*a*) one-component systems, (*b*) two-component systems, and (*c*) a note on electrical conductivity and volume. Headings under the latter are: (*a*) activation energy and configurational change, (*b*) theories of Frenkel and Eyring and their application, (*c*) free space or breaking of bonds as determining factors for viscosity and cohesion, (*d*) activation energy of viscosity and cohesion, and (*e*) viscosity of mixtures. There are forty-six references. C—9.

Ester Resonance in Cellulose Compounds: Theory. Sven H. Sönnerskog. *Svensk Papperstidn.*, 1950, pp. 185-187. In German. (Through *Chem. Abstr.*, 1951, 45, No. 1, p. 346[c]). The theory is advanced that, because of the high degree of mobility of the H atom linked to C-1 in the glucose units of cellulose, the migration could cause ester resonance resulting in hydrolysis of glucosidic ether linkages. Formulæ are given to illustrate the electronic mechanism for the alkaline degradation of oxycellulose and nitrocellulose in accordance with this theory, which is similar to Heuser's explanation for ageing of alkali cellulose. C—9.

Osmotic and Light-Scattering Data for Dilute Solutions: Treatment. T. G. Fox, Jr., P. J. Flory and A. M. Bueche. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 285-289. The authors examined the adequacy of the equation $\pi/c \backsimeq (\pi/c)_0[1+\Gamma_2 c+(5/8)\Gamma_2^2 c^2]$ (where c is the concentration, and Γ_2 is a parameter dependent on the polymer-solvent pair, the temperature and the molecular weight of the polymer) as a means of expressing osmotic pressure-concentration data. The equation is found to represent the π/c against c relationship for a variety of polymer-solvent combinations, including both homogeneous and heterogeneous polymers. The equation applies only in dilute solutions where $(\pi/c)/(\pi/c)_0 < 3$. The application of the equation

$$(c/\tau) \backsimeq (c/\tau)_0[1+2\Gamma_2 c+(15/8)\Gamma_2^2 c^2]$$

(where τ is the excess turbidity of the solution over that of the solvent), to turbidity measurements is illustrated, using new data obtained on polystyrene in benzene. General use of both equations is recommended for the evaluation of molecular weights, and of thermodynamic parameters Γ_2, from osmotic and/or light-scattering data on dilute solutions of polymers. C—9.

Viscosity Data of Organic Liquids. J. W. M. Boelhouwer, G. W. Nederbragt and G. Verberg. *Appl. Sci. Res.*, 1950, **A2**, No. 4, pp. 249-268. Viscosities of thirty-seven organic liquids, with molecular weights ranging from 120 to 807, have been measured. The viscosity-temperature curves obtained are compared with those of *n*-paraffins. The influence of ring structures and polar groups on viscosity is discussed. C—9.

Viscosity and Degree of Polymerisation in Pectin Solutions. B. Vollmert. *Makromol. Chem.*, 1950, 5, No. 2, pp. 128-138. In German. Experiments have shown that the viscosity (expressed by the viscosity number $Z\eta$) of aqueous

pectin solutions decreases with increasing degree of esterification. Free carboxyl groups cause an abnormal rise of viscosity; this can be eliminated by esterification. The viscosity of pectin nitrates in organic solvents varies in the same way. It is shown that viscosimetric molecular-weight determinations are possible only after a quantitative esterification of all carboxyl groups. C—9.

Light: Action on Textiles. R. Dicker. *Rayonne*, 1950, 6, No. 4, pp. 109, 111, 113; No. 5, pp. 106-109; No. 6, pp. 53, 55, 57-58; No. 7, pp. 50-52; No. 8, pp. 85, 87, 89-90; No. 9, pp. 55-57, 59, 61; No. 10, pp. 67-70; No. 11, pp. 95-98. In French. An extensive survey has been made on work carried out in investigating the effect of light both on grey cloth and coloured fabrics made of cotton, rayon, wool, and synthetic fibres, considerable attention being paid to the cellulosic materials. Results show that the problems involved are of great complexity since photo-degradation depends on numerous factors which may have a reciprocal effect on one another. Photo-oxidation in undyed fabrics is affected by moisture, temperature, and composition of the atmosphere. In the case of bleached and/or dyed fabrics, additional factors to the foregoing must be taken into consideration, namely: the nature of the chemicals and/or dyestuffs used; the dyestuff/fibre relationship (including actual colour, solidity, and so on); the mode of bleaching, dyeing and finishing, together with concentrations of dyes and chemicals. The materials are considered individually and then in conjunction with the processing factors. Data are given throughout. C—9.

Ultra-violet Illumination: Denaturing and Photo-Oxidising Action on Dissolved Proteins. S. Fiala. *Chem. Listy*, 1946, 40, pp. 82-86 (through *Brit. Abstr.*, 1950, **A II**, November, p. 1242). The rate of denaturation of proteins (human and equine serum albumin and pseudoglobulin) exposed to irradiation at $\lambda < 3000$ Å is found to be the same in the presence or absence of oxygen, or of added denatured protein; that is, the reaction is not one of photo-oxidation or of auto-catalysis. Irradiation at λ 3000-4000 Å causes photo-oxidation, but without denaturation, as the molecular weight of the proteins is unaffected. Prolonged irradiation for 150 minutes on protein solutions leads to production of traces of hydrogen peroxide. C—9.

Directional Ultra-violet Absorption and Chromophores in Highly Oriented Silk Fibroin. E. Schauenstein, J. O. Fixl, and O. Kratky. *Monatsh. Chem.*, 1949, 80, pp. 143-146 (through *Brit. Abstr.*, 1950, **A I**, September, p. 546). Natural silk fibroin shows only one absorption band in the region 3200-4500 mm.$^{-1}$, which is due to the presence of tyrosine residues. After swelling in aqueous ethyl alcohol, and stretching and rolling, fibroin shows a second band with a maximum at 4050 mm.$^{-1}$. Absorption experiments were also made using polarized light with the vector at different angles to the direction of stretching. C—9.

Light: Effect on Vat-Dyed Cellulose. A. Landolt. *Textil-Rdsch.*, 1950, 5, No. 11, pp. 441-455. In German. A number of tests have been carried out on thirty-eight vat-dyes in an attempt to assess the extent to which dyestuff constitution causes damage to cellulose fibres, and to study any accelerating or restraining effect of substituent groups in the molecule. The reactions of the parent substances of the dyestuffs under investigation indicate auto-photosensitisation which can be modified by substituent groups or by a special molecular arrangement. It is unlikely that a general rule will be established for relating extent of potential fibre damage to dyestuff constitution. Relation of effect to light energy is difficult, owing to the different degree of light-absorption by the various dyestuffs, since the light-energy depends on the wavelength. It has been found that, under suitable conditions, vat-dyes can bring about both oxidation and reduction of cotton fibres under the action of light. An experimental technique, in which rapid alternation of these is secured, is described. There are extensive tables relating dyestuff constitution, tear-strength, reaction with hydrogen peroxide, "blue-test" results, and reflection of various wavelengths. C—9.

Permanganate: Effect on the Ultra-violet Absorption Spectra of Aromatic Amino Acids and Proteins. Ward J. Haas, Irwin W. Sizer, and John R. Loofbourow. *Biochim. Biophys. Acta*, 1951, 6, No. 4, pp. 601-605. The effects of permanganate oxidation on the 293° K. and 77° K. ultra-violet absorption spectra of the aromatic amino acids, have been studied. The susceptibility of tyrosine and tryptophane, and the relative resistance of phenylalanine to

such oxidation, have been confirmed. Spectroscopic evidence was obtained for the formation of dopa in solutions of tyrosine. Permanganate-induced changes in the structure of insulin and pepsin absorption spectra at 77° K. are shown to parallel in several respects the spectrum changes in tyrosine and tryptophane similarly treated. C—9.

Infra-Red Spectra: Effect of Low Temperatures. R. M. Hainer and G. W. King. *Nature*, 1950, **166**, No. 4233, p. 1029. The infra-red spectra of a number of compounds have been examined at the temperature of liquid helium (4° K.). At this low temperature narrowing of the band-width occurs with an increase in definition but without invoking a change of phase. It is concluded that low-temperature examination of the spectra of large molecules can produce considerably more detail provided the spectroscope has sufficient resolving power. C—9.

Light-Absorption by Proteins. I and II. E. Schauenstein. *Monatsh. Chem.*, 1949, **80**, pp. 820-842 and 843-855 (through *Brit. Abstr.*, 1950, **A I**, September, p. 564). (I) The absorption spectra of the aromatic amino-acids are found to be additive when in peptide combination, and may be used for the qualitative and quantitative analysis of proteins. The spectra of silk fibroin and actomyosin are found to be the sum of the spectra of the individual aromatic amino-acids present plus a band at 4200 A. due to a C=N binding in the peptide chain. (II) The additional band occurring in the spectra of silk fibroin at 4200 Å appears to be due to a true binding, in that in polarised light absorption depends on the direction of the binding. The C=N link appears to lie at an angle of 45° to the axis of rotation, that is, inside the peptide chain. A clear correlation was found to exist between the particle size and the intensity of the scattered radiation. C—9.

Spectroscopy: New Source of Light for the Far Ultra-violet. B. Vodar and N. Astoin. *Nature*, 1950, **166**, No. 4233, pp. 1029-1030. Sliding sparks (sparks produced along the surface of a solid) obtained with copper electrodes in a vacuum have been found to be a convenient source of light for spectra in the far ultra-violet. C—9.

Absorption-Spectral Curves of Solid Films of Dyes. T. Vartanyan. *Zhur. Tekh. Fiz.*, 1950, **20**, pp. 847-853 (through *Chem. Abstr.*, 1950, **44**, No. 21, p. 9799°). Continuous films of twenty-four organic dyes were produced successfully by rapid evaporation of alcoholic solutions on quartz plates. Absorption spectra are given, and compared with spectra obtained from solutions. C—9.

Constitution and Light-Absorption. I. Carbonyl Derivatives. Ferdinand Bohlmann. *Chem. Ber.*, 1951, **84**, Nos. 5-6, pp. 490-504. In German. Various nitrogen compounds, mostly based on hydrazine, are used in confirmatory tests for carbonyl compounds. The absorption spectra of several of these derivatives have been examined. The generally observed shift of the light-absorption band into the longer-wave regions, as compared with the initial carbonyl compounds, is attributed to the free electron-pair of the NH group. C—9.

Constitution and Light-Absorption. II. Diacetylene Compounds. Ferdinand Bohlmann. *Chem. Ber.*, 1951, **84**, Nos. 5-6, pp. 546-556. In German. The paper deals with a series of hydrocarbons containing the diacetylene group in a chain of conjugated double-bonds. The absorption spectra of the lower members of the series are "abnormal", but more "normal" spectra are obtained with an increasing number of C:C bonds. The abnormality is ascribed to the mutual interference of the electron pairs on being irradiated with light, this interference being naturally more pronounced in the shorter chains. As compared with the corresponding ethylene compounds, the maxima are shifted into the shorter wave regions and the extinction values are considerably lower. C—9.

(Azoic) Ice-colours: Influence on the Change in (Tensile) Strength of the Fibre under the Influence of Light. S. I. Mitel'man. *Tekstil. Prom.*, 1947, **7**, 31-33 (through *Chem. Abstr.*, 1951, **45**, No. 9, p. 4045[f]). Azoic dyes do not generally accelerate the photochemical oxidation of cellulose; some actually retard the process, this depending on the dye and not on any particular naphthol or base. The residual strength of some dyed samples, after exposure to light, has been investigated for a number of dyes. C—9.

Indigo: Influence of the Solvent on the Absorption Spectrum. Giorgio Nebbia. *Mikrochem.*, 1951, **36/37**, pp. 576-579. In German. A study has been made of

the absorption spectra of saturated solutions of indigo in various solvents. Two characteristic absorption bands were established. C—9.

Cellulose: Photochemical Degradation in the Presence of Tungstic Acid. Adolph Bolliger and Neil T. Hinks. *Australian J. Exptl. Biol. Med. Sci.*, 1949, 27, pp. 569-573 (through *Chem. Abstr.*, 1951, 45, No. 1, p.345[e]). A correction is made to the abstract of this paper in *Chem. Abstr.*, 1950, 44, No. 15, p. 7057[e] (see *J. Textile Institute*, 1951, 42, A128). C—9.

Raman Spectra of Small Quantities of Liquids. San-ichiro Mizushima, Takehiko Shimanouchi and Tadao Sugita. *Mikrochem.*, 1951, 36/37, pp. 574-575. In German. A cell is described with which it is possible to take Raman spectra using only one millilitre of liquid. The division of the container permits the simultaneous study of two different liquids for purposes of comparison. By the use of the divided polaroid filter it is also possible to determine the polarisation of the Raman lines. C—9.

Tendon-Collagen: Ultra-Violet Absorption. I. E. Schauenstein and D. Stanke. *Makromol. Chem.*, 1951, 5, No. 3, pp. 262-286. In German. Human collagen shows a remarkable ultra-violet absorption between 2,000 and 4,200 mm.$^{-1}$ The band increases with increasing *pH*, and consists of (1) a small component independent of *pH* and belonging to the chromophorous amino acids, and (2) a more intensive band, dependent on *pH*, and ascribed to the enolic form of the peptide group. Between *pH* 5 and 7, the region of the iso-electric point, the intensity of this "peptonol band" remains constant. Absorption measurements with polarized ultra-violet light show an oriented arrangement of the "peptonol groups". By means of the dichroic quotient it was possible to eliminate some of the structures hitherto proposed for collagen. C—9.

Absorptiometric Colorimetry. C. H. Giles. *J. Soc. Dyers Col.*, 1950, 66, No. 12, pp. 615-629. This paper is a review which gives a short account of the basic principles of the operation and construction of absorptiometric colorimeters, and of their historical development, and which offers a guide to the wider literature on the subject. Descriptions are given of the Beer-Lambert laws, photoelectric cells and absorptiometric colorimeters incorporating them, the various types of visual comparison instruments, apparatus for making continuous measurements, the reasons for the use of colour filters and their correct selection, the determination of coloured substances in mixed solution, the accuracy of absorptiometric colorimeters, desirable future developments, and terminology. There are eighty-five references. C—9.

Colorimetry—A Panel Discussion. *Bull. A.S.T.M.*, 1950, December, pp. 38-44. This paper is a report of a panel discussion which took place at a technical session (held at Pittsburgh in March, 1950) of Committee D-1 on Paint, Varnish, Lacquer and Related Products, of the American Society for Testing Materials. The discussion embraced some of the most recent techniques and thinking regarding colour measurement, specification, and control, in relation to the interests of the Committee. C—9.

Gelatin Light Filters: A New Cement for—. J. W. Nicholas and F. F. Pollak. *J. Sci. Instrum.*, 1951, 28, No. 1, pp. 23-24. The synthetic resin Piccolyte WW 100 (a terpene polymer) dissolved in xylene is proposed as a cement for gelatine light filters. Its advantages are said to be a high thermal softening point, good adhesion to glass, absence of tendency to form air-bubbles, rapid drying, and freedom from yellowing with age or on exposure to light. The technique of its use is described. There are six references. C—9.

Single Glass Surfaces: A Phase Contrast Method for the Study of the State of Polish. J. V. Ramsay. *J. Sci. Instrum.*, 1951, 28, No. 1, pp. 24-25. A phase contrast method for the study of the state of polish of single glass surfaces has been developed. The method, which consists of reflexion of a spherical wave from the surface to be examined, can be applied to the study of any reflecting surface which has a reasonable degree of polish, that is, sufficient to form an image of the source after reflexion. C—9.

Precision Colorimetry: Principles Measuring Maximum Precision Attainable with Commercial Instruments. C. F. Hiskey, Jacob Rabinowitz and Irving G. Young. *Analyt. Chem.*,* 22, No. 12. pp. 1464-1470. By the use of photoelectric colorimeters as null detectors in the comparison of a standard and an unknown, it is found that precision increases as the absorbance of the standard is raised.

The maximum precision obtained is found to be proportional to the total radiant power available and to the way that power is distributed between absorbance and sensitivity. This study presents data on three widely differing commercial instruments—the Beckman DU Spectrophotometer, the Coleman Spectrophotometer Model 14 and the Lumetron 402E Colorimeter—in order to demonstrate the methods used in evaluating the maximum precision obtainable with any instrument. There are five references. *(1950). C—9.

Half-Shadow Plate: Use with Uniform Field Compensators. H. G. Jerrard. *J. Sci. Instrum.*, 1951, **28**, No. 1, pp. 10-14. The theory is given of a half-shadow arrangement, which consists of a muscovite mica plate mounted so as to cover half the field of view and so that it can rotate about an axis perpendicular to its plane. The arrangement can be employed with any uniform field compensator which is used between crossed polariser and analyser. It has been studied with Soleil compensators, and in particular with one which consists of two wedges, cut as for a Babinet compensator, but arranged with their thick ends adjacent. Some theoretical aspects of this "reversed Babinet" compensator are given, and the effect of inaccurate orientation of the optic axes is mentioned. An expression for the half-shadow sensitivity is obtained from a general expression for sensitivity in which the response characteristics of the eye are taken into account. Curves are drawn which show the variation of the half-shadow sensitivity with the phase difference and azimuth of the mica plate. Plates having phase differences in the neighbourhood of $\pi/5$ and placed in azimuths which give a suitable brightness of the field of view have been found satisfactory. There are twenty-one references. C—9.

Light-Absorption by Microcrystalline Powders: Measurement. B. Mühlschlegel. *Ann. Phys.* [6th Series], **9**, No. 1, pp. 29-39. In German. The measurement of the light-absorption of microcrystalline powder layers has been carried out by means of a modified Gisolf sphere method. Calculation shows that slight changes in the arrangement are sufficient to enable quantitative determinations of the absorption power to be made. The derived expressions give a relatively simple relationship between the measured quantities and the diffuse absorption and transmission powers, the porous nature of the layer being taken into account. Some measurements on cadmium-sulphide powders gave acceptable results. C—9.

Piezoelectric Plates: Interferometric Studies on Vibration. S. Tolansky and W. Bardsley. *Proc. Phys. Soc.*, 1951, B, **64**, Part 3, pp. 224-230. A description is given of the application of a number of multiple-beam interference methods to the study of the piezo-electric oscillations of some quartz crystals. The distribution of surface nodes and anti-nodes of motion, and the amplitudes of oscillation, are revealed by simple methods. By employing a stroboscopic illumination technique the phase relations between the various vibrating regions of the crystal surface are revealed. By a modified technique, fringes are obtained through the crystal body, and these reveal changes in the optical thickness. One crystal developed sharp surface discontinuities after being set into oscillation, indicating that crystallographic glide or slip had taken place. This is shown to be closely related to the familiar shattering of quartz crystals at excessive amplitudes of oscillation. C—9.

Tricolour Photometer. A. G. de Almeida. *Mikrochem.*, 1951, **36/37**, pp. 113-116. In German. A photometer for colour analysis is described which can be used for the measurement of either normal or fluorescent colours in solid form or in solution. An advantage is that the distance between the light source and the illuminated object is constant. C—9.

Rheology: Application to some aspects of Linoleum Manufacture. S. R. W. Martin. *J. Oil Col. Chem. Ass.*, 1951, **34**, March, pp. 97-118. This paper is a review of four papers (*Nature*, 1950, **165**, April 8, p. 558) describing three different ways of assessing the rheological properties of the linoleum composition, all of which have been put to practical use. By way of introduction, a description is given of the manufacturing processes involved in producing linoleum, and it is shown that especially now, when the conventional raw materials of the industry are being substituted, a study of the rheological properties of the composition can be very helpful. There are nine references. C—9.

Thermal Conductivity Apparatus: Automatic Control. E. M. Herrmann, R. B. Plate and W. P. Sinclair. *Bull. A.S.T.M.*, 1950, December, pp. 69-74.

An apparatus which is used for determining the thermal conductivity of insulating materials at the U.S. Naval Engineering Experiment Station at Annapolis, Md., is described, with pictures and diagrams. The equipment is said to save time and money, to give reproducible and accurate results, and to require little surveillance and maintenance. C—9.

Automatic Frost Point Hygrometer. Stanley H. Jury and William Licht, Jr. *Analyt. Chem.*, 1950, 22, No. 12, pp. 1536-1540. The authors describe an automatic electronic device for the determination of small amounts of moisture in air. There are six references. C—9.

Organopolysiloxanes: Boundary Lubricating Characteristics. C. C. Currie and M. C. Hommel. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2452-2456. The results of a study on the effectiveness of organopolysiloxanes as lubricants under thin film conditions are reported. Certain methylpolysiloxane fluids appear to be satisfactory lubricants for such bearing combinations as steel-zinc, steel-nylon, steel-cadmium, steel-babbitt, steel-bronze, and bronze-nylon. Certain methylphenylpolysiloxane fluids are satisfactory for steel-zinc, steel-chrome, and steel-cadmium. The effect of phenyl content on the lubricating properties of organopolysiloxanes is discussed. There are eleven references. C—9.

Fountain Pen Dosimeter: Charging Device. S. Eklund and L. Hedlund. *J. Sci. Instrum.*, 1951, 28, No. 1, p. 30. A small electrostatic charging unit, which is attached to the free end of the ionization chamber of an ordinary pen dosimeter, is described, with a diagram. Potentials up to 800V. have been reached, and carefully designed seals permit a pen and a charging device to be used also in 100 per cent. relative humidity. C—9.

Collection of Mist and Dust for Particle Size Measurement. H. G. Bourne, Jr., and Lee B. Fosdick. *Analyt. Chem.*, 1950, 22, No. 12, pp. 1563-1565. Using commercially available apparatus, air-borne particulate matter was precipitated electrostatically upon a bright-line hemacytometer with the aid of two simple fixtures described in this article. The diameter of individual particles was measured with a filar micrometer. The size range of atmospheric dust, and in-plant dust and mist, found by this method, is compared with results using the Owens jet dust counter. The advantages of the method are said to be that density of deposits may be controlled; solution of dust and mist is avoided; and particles are precipitated in their original state. There are fourteen references. C—9.

The Collection of Small Samples for Examination by X-Ray Powder Methods. R. Brooks and T. C. Alcock. *J. Sci. Instrum.*, 1951, 28, No. 1, p. 28. A method of collecting very small samples for examination by X-ray powder methods is described. The samples, which consisted of small deposits adhering to glass surfaces, were gathered up in a film from a solution of a 3:2 mixture of acetone and amyl acetate in which was dissolved a few drops of an 8 per cent. solution of cellulose acetate. C—9.

A Constant Current Regulator. H. W. Patton. *Analyt. Chem.*, 1951, 23, No. 2, pp. 393-394. An inexpensive regulating device is described which, when used in conjunction with lead storage cells, gives satisfactory compensation for small variations of current due to changes in circuit resistance or battery voltage. C—9.

Polyethylenes: Electron-Diffraction Study. J. J. Trillat. *C. R. Acad. Sci. Paris*, 1950, 230, pp. 1522-1524 (through *British Abstr.*, 1950, **A I**, July, p. 408). Electron-diffraction studies of polyethylene in the form of a very thin film, produced by evaporation of a drop of a benzene solution on a collodion membrane, have given crystallite lattice dimensions in very close agreement with those obtained by X-ray analysis. C—9.

Electron Microscopy. F. A. Hamm. *Analyt. Chem.*, 1951, 23, No. 1, pp. 17-20. *Biophys. Acta*, 1951, 7, No. 1, pp. 1-18. In French. This paper on the construction of the present-day electron-microscope, the various devices for improving its performance, and probable achievements in the near future, is based on the papers read at the International Congress on the Electron-Microscope held in Paris, 1950. In addition to diagrams, photographs and electron micrographs there is a list of sixty-five references. C—9.

Electron Microscopy. F. A. Hamm. *Analyt. Chem.*, 1951, 23, No. 1, pp. 17-20. This paper is a review of recent advances in electron microscopy, and includes

discussion on new kinds of instrument design, as well as new applications of the electron microscope in the fields of metallurgy and biology. There are sixty-one references. C—9.

Electron Microscopy of Dividing Cells. George Rozsa and Ralph W. G. Wyckoff. *Biochim. Biophys. Acta*, 1950, **6**, No. 2, pp. 334-339. Electron micrographs have been made of thinly sectioned onion-root tip treated with various fixatives. These demonstrate the great damage done to all fine cell structures by acid fixation, and illustrate the appearance of some of these structures, including chromosomes, after non-acid fixation. C—9.

Flow Characteristics of Organopolysiloxane Fluids and Greases. C. C. Currie and B. F. Smith. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 2457-2462. The results of a study of the flow characteristics of organopolysiloxane fluids and greases is reported. There are ten references. C—9.

Synthetic Lubricants: Functional Selection. R. G. Larsen and A. Bondi. *Ind. Engng Chem.*, 1950, **42**, No. 12, pp. 2421-2427. The basic principles guiding the selection of synthetic lubricants for specific application are summarized. The physical and chemical properties of several lubricants of different chemical classes have been assembled in a single table. There are nineteen references. C—9.

High Temperature Viscometer. N. H. Spear and L. P. Herrington. *Analyt. Chem.*, 1951, **23**, No. 1, pp. 148-151. A new high-temperature viscometer has been developed which is calibrated at ordinary temperatures, has a temperature range to over 300° C., and measures with an accuracy better than 5 per cent. Small volumes (70 ml.) of test liquids are required and no hazardous liquid baths are employed. Viscosity data for three liquids are given. There are diagrams of the viscometer, and seven references. C—9.

Impact Resilience as a Brittleness Test for Polyvinyl Plastics. Gerard Friedlander. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1545-1551. Impact resilience, as used in rubber technology to measure elasticity and internal viscous friction, has been applied to plasticised polyvinyl chloride to test its brittleness. The minimum point on the impact-resilience/temperature curve defines the transition from ordinary to rubber-like elasticity, and is related to the percentage concentration and type of plasticiser used. Below this minimum temperature, impact resilience is directly related to brittleness. There are thirteen references. C—9.

Lubricating Grease: Improved Miniature Penetrometer Cones for Determination of Consistency. B. W. Hotten and G. M. Kibler. *Analyt. Chem.*, 1950, **22**, No. 12, pp. 1574-1575. Penetrometer cones requiring only small samples of grease, but giving penetration measurements rectilinearly related to the A.S.T.M. penetration over the entire range of grease-texture types and consistency grades, have been devised, and are illustrated with diagrams and photographs. C—9.

X-Ray Diffraction Photographs: Interpretation. N. F. M. Henry, H. Lipson, and W. A. Wooster. London, Macmillan, 1951, x+258 pages. This text-book gives an account of all the commonly employed methods of taking and interpreting X-ray diffraction photographs of single crystals, and of polycrystalline specimens. There are seventeen chapters, four appendices, ten tables, a subject index, and a bibliography. C—9.

A Low-Power Alternating Voltage Stabilizer. D. J. R. Martin and A. J. Maddock. *J. Sci. Instrum.*, 1951, **28**, No. 1, pp. 1-3. A unit is described which provides an a.c. output at 15V (pre-set within the range 12-18V) and possible current drain of 2 mA; its main use is considered to be as a source of stable reference voltage, for the efficiency of the system is inherently low and the output voltage is sensitive to load variations. A change of alternating input voltage between 190 and 270V (that is, 230 ± 17 per cent.) produces ±0·015V (±0·1 per cent.) change in output voltage. Temperature compensation is provided, and the frequency coefficient and waveform distortion are both small. C—9.

The Mounting and Centring of Specimens in High Temperature X-Ray Powder Cameras. E. G. Steward. *J. Sci. Instrum.*, 1951, **28**, No. 1, pp. 29-30. The author describes a specimen centring device suitable for use in high temperature X-ray powder cameras of the type described by E. A. Owen, *J. Sci. Instrum.*, 1943, **20**, p. 190. A photograph and drawings are included. C—9.

Perlon Fibres: Optical and X-Ray Investigations. E. Kordes, F. Günther, L. Büchs and W. Göltner. *Kolloid Z.*, 1950, **119**, No. 1, pp. 23-38. In German. Perlon contains both crystalline and amorphous regions, the relative proportions between the two varying according to conditions of preparation and after-treatment. Conoscopic and microscopic investigations were carried out on fibres ranging from silk-like fineness to a coarse bristle, in order to discover relationships between optical phenomena (such as birefringence, refractive index, interference figures, *etc.*) and processing history. X-ray studies lead to conclusions which support those deduced from the optical observations; the latter methods are more sensitive in measuring crystallinity. It appears that the lattice structure is independent of chain length, even down to the lowest degree of polymerisation; nevertheless, there is no structural similarity to that of monomeric ε-aminocaproic acid. C—9.

Organic Compounds [Crystallography]. (Mrs.) D. Crowfoot Hodgkin and G. J. Pitt. *Annual Reports on the Progress of Chemistry*, 1950, **47**, pp. 432-469. This is a review of the literature. There are two hundred and forty-five references. (See *J. Textile Institute*, 1951, **42**, A577.) C—9.

Practical Electron Microscopy. V. E. Cosslett. London, Butterworths, 1951, xiii+299 pages. This book is intended as an introduction to the basic features of the electron microscope, and to the functioning and operation of the several parts of the instrument. It describes methods of specimen preparation. C—9.

Rheometric Tests and Extrusion. S. Eccher. *Ind. Engng Chem.*, 1951, **43**, No. 2, pp. 479-487. A cylindrical rheometer of the Couette type was used to determine the rheological properties of extruded materials. Results are reported on twenty-five materials—natural and synthetic rubbers and compounds of both with various fillers; they were within shear rate limits of 1 to 100 reciprocal seconds. The relationship between D (rate of shear) and τ (shear stress) may be interpreted by the power law $D = -(\tau/c)^n$, where n and c are parameters characteristic of the material. Using a two-inch extruder and the same materials, attempts were made to ascertain the limits of the application of the power law in laminar flow through a cylindrical hole. Measurements of pressure and flow were made using discharge holes of various diameters, and operating the screw at various speeds. Reasonable agreement was found between values of flow and pressure determined with an extruder, and those calculated from parameters n and c determined with the cylindrical rheometer. There are ten references. C—9.

Sourcebook on Atomic Energy. Samuel Glasstone. London, Macmillan, 1950, vi+546 pages. The declared aim of this book is to provide the general reader, as well as teachers, scientists, and engineers, with an authoritative account of the release and utilisation of atomic energy. There are eighteen chapters: they deal comprehensively with atomic theory, radioactivity, isotopes, nuclear fission, cosmic rays, and related matters. C—9.

Deformation at High Strain Rates Using High-Speed Motion Pictures. Herbert I. Fusfeld and Josephine Carr Feder. *Bull. A.S.T.M.*, 1950, December, pp. 75-79. The article describes a method for studying the geometry of deformation processes of metals at drawing speeds, using high-speed motion pictures. A shadow technique is used which permits measurements of strain, and of the shape of the neck, throughout a tension test at high speeds. C—9.

Glued Laminated Wood Construction: Strength. Alan D. Freas. *Bull. A.S.T.M.*, 1950, December, pp. 48-59. Information is presented on the strength testing and design of glued laminated wood construction, special attention being given to laminated beams and columns. Results of tests on the effect of lamination thickness in beams, and tests on beams and columns containing joints and knots, are discussed at length. Application of this construction is illustrated with several photographs of arches, curved rafters, railway trestles, *etc.*, to show its wide variety of use. Advantages and disadvantages are listed. C—9.

X-Rays: Theory of Scattering at Statistically Disordered Linear Lattices. Fine Structure of High Polymers. R. Hosemann. *Z. Elektrochem.*, 1949, **53**, pp. 331-334 (through *Brit. Abstr.*, 1950, **A I**, July, p. 407). In an attempt to explain the X-ray scattering effect in high polymers, a lattice with a definite ideal degree of disorder has been examined. This lattice, for which the exact scattering formulæ can readily be deduced, gives rise to crystal reflections and liquid interferences, with all possible intermediate stages. A three-dimensional

model on the same lines can be drawn up, and conclusions about the fine structure of high polymers can be reached. C—9.

A Thermal Precipitator for the Gravimetric Estimation of Solid Particles in Flue Gases. J. Bredl and T. W. Grieve. *J. Sci. Instrum.*, 1951, 28, No. 1, pp. 21-23. An instrument is described which will collect all the solid matter from a representative sample of flue gases, and handle a sufficiently large sample of gas for the deposit to be easily weighed. Its advantages over the usual filtering methods are that it does not offer excessive resistance to the gas flow, and that it is apparently capable of retaining the smallest size of particle present in flue gases. In addition, the use of aluminium foil collecting-surfaces facilitates accurate weighing, since, unlike the usual filtering materials, their capacity for adsorbing moisture is negligible. C—9.

Turbulent Transfer in Process of Heat Exchange, Diffusion and Chemical Processes. S. A. Ghol'denbergh. *Izvestiya Akademii Nauk SSSR, Otdelenie Teknicheskikh Nauk*, 1950, No. 5, pp. 689-694. A translation of this paper is available in the Science Museum Library. C—9.

A Universal Loading Machine for Engineering Tests on Soils. B. K. Hough. *Bull. A.S.T.M.*, 1950, December, pp. 44-47. A universal loading machine is described which will carry out on soils several engineering tests which heretofore required separate machines—tests such as direct shear, triaxial shear, and consolidation testing. The machine has been tested in service for several years, and is a compact unit which affords greater flexibility in load application and measurement than is given by some of the older testing equipment. C—9.

Velocity Distribution and Fluid Friction in Smooth Concentric Annuli. R. R. Rothfus, C. C. Monrad and V. E. Senecal. *Ind. Engng Chem.*, 1950, 42, No. 12, pp. 2511-2520. The isothermal flow of air at room temperature through two smooth, horizontal annuli of widely different radius ratios has been investigated with regard to velocity distribution and static pressure drop. Point velocities were measured by small impact tubes calibrated in streamline flow, adjustments being made to offset the effect of turbulence on the calibrations. Extensive conclusions are reported. There are twenty-one references. C—9.

Rubber to Glass: Adhesion. Hubert Tolle. *Rev. Gén. Caoutchouc*, 1950, 27, pp. 572-574 (through *Chem. Abstr.*, 1951, 45, No. 1, p. 380[b]). By depositing an adhesive film of aluminium and copper on the surface of hot glass, and then sticking the desired natural rubber or synthetic elastomer to this, bonds which are perfectly impermeable to water are obtained. Such a method is particularly suitable for portholes, automobile glass installations, *etc.* C—9.

Diffusion Theory: Applications to Evaporation from Droplets and Flat Surfaces. G. Luchak and G. O. Langstroth. *Canad. J. Res.*, 1950, Section A, 28, No. 6, pp. 574-579. In examining the evaporation from droplets and flat surfaces, an evaluation has been made of diffusion theories based on the "quasi-stationary" states at the droplet-atmosphere interface. Results indicate that the equations are good to a high degree of approximation in ordinary circumstances. C—9.

Sonic and Ultrasonic Vibration: Bibliography, Biological, Biochemical and Biophysical Applications. George M. Naimark, Jane Klair and William A. Mosher. *J. Franklin Inst.*, 1951, 251, No. 2, pp. 279-299. The bibliography consists of 580 references. C—9.

The Configuration and Packing of the Chain Molecules of Native Starch as Derived from X-Ray Diffraction of Part of a Single Starch Grain. D. R. Kreger. *Biochim. Biophys. Acta*, 1951, 6, No. 3, pp. 406-425. Using a new micro-method for X-ray diffraction, a fibre diagram of a native starch grain was obtained from part of a large single starch grain occuring in the orchid *Phajus grandifolius*. The evidence suggests that the chain molecules are orientated radially. The fibre period can be explained if the molecules assume the shape of a spiral chain with three α-glucose residues per turn. This shape also satisfies the hexagonal ratio of the axes in the basal plane of the provisional unit cell, and the intrinsic birefringence of starch grains mentioned by Frey-Wyssling. A hexagonal unit cell is suggested with axes $a=18$A and $b=10{\cdot}6$A, through which 18 chains run. The cell contains 54 glucose and water molecules, and the X-ray density of such a packing is consistent with observed densities of starch grains. C—9.

Elastic Constants of Gelatinous Substances. Arvind Mohan Srivastava. *J. Amer. Chem. Soc.*, 1951, 73, No. 1, pp. 489-490. A note is published on the measurement of elastic constants of gels by means of the ultrasonic technique developed by Pellam and Galt and modified by Teetar. Ultrasonic waves are impinged on a slab of gel, received by a quartz crystal, and detected on a cathode-ray tube. Sharp minima were observed in the transmitted intensity when the angles of incidence of the waves on the gel were of certain values. From these critical angles, the velocity of the waves was computed. From the velocity of the waves and the density ρ of the gel, the elastic constants could be determined. C—9.

Finite Elastic Straining. K. H. Swainger. *Appl. Sci. Res.*, 1951, **A2**, No. 4, pp. 281-298. Finite elastic straining is analysed with *all* quantities referred consistently to the *deformed* body taken as the function domain. The straining-displacement of a typical point is relative to a set of axes imbedded in the body at *one* arbitrary point and rotating in fixed space with that neighbourhood if necessary in a particular problem. The resulting plane stress equations have precisely the same form as in the classical theory but relate to true quantities in the *deformed* body. The solution of a *circular* hole in a *deformed* sheet under simple tension is given, and checks closely with experiment on rubber. The solution of a *deformed* quadrantal cantilever is given. Any boundary value problem already solved for the classical infinitesimal strains theory can be applied directly as a finite strains solution for the *deformed* body. C—9.

Crystal, Fourier and Patterson Spaces: Relations between Symmetry. Werner Nowacki. *Schweiz. Mineral. Petrog. Mitt.*, 1950, 30, pp. 147-160 (through *Chem. Abstr.*, 1950, 44, No. 21, p. 9794^e). The symmetry of the *F*-body of a crystal space is said to be equal to the symmetry of the origin in the considered space group. It yields all relations between the F_{hkl}, $|F_{hkl}|$, and α_{hkl} which are important for a Fourier synthesis. The symmetry of a Patterson space of a crystal space is equal to the centrosymmetrical, symmorphous space group that belongs to the arithmetic Laue class of the crystal space. There are 24 possible symmetries for Patterson spaces. The 219 nonenantiomorphous space groups of crystal space can be uniquely discerned by the study of the position and weights of the maxima in the Patterson spaces. C—9.

Corrugated Diaphragms: Rigidity. J. A. Haringx. *Appl. Sci. Res.*, 1951, **A2**, No. 4, pp. 299-325. The problem of calculating the deflection of diaphragms with trapezoidal, triangular or arc-shaped corrugations, is reduced to the solution of a linear differential equation by substituting an imaginary flat plate (with the same properties) in place of the diaphragm. The coefficients of the equation differ for thick and thin sheets. For small deflections, the introduction of corrugations into the sheet is found to increase the rigidity of the diaphragm. C—9.

Cotton Fibre: Structure, Determined by X-Rays, and Strength. E. E. Berkley, O. C. Woodyard, H. D. Barker, T. Kerr and C. J. King. *U.S. Dep. Agric.*, 1948, *Tech. Bull.*, 949, 64 pp. (through *Brit. Abstr.*, 1951, B II, January, p. 69). The relation between X-ray angle and fibre strength, and other characteristics, are considered. Environmental conditions, especially water relations, are thought to affect the physical properties of cotton to a considerable extent. Structure-strength relations are said to differ in different species and sometimes in different varieties of the same species. C—9.

Elastomers: Thermal Conductivity under Stretch and at Low Temperatures. T. M. Dauphinee, D. G. Ivey and H. D. Smith. *Canad. J. Res.*, 1950, Section A, 28, No. 6, pp. 596-615. Heat conductivity of natural rubber and synthetic rubber GR-S was studied from 0-100 per cent. stretch and from $+50°$ C. to $-170°$ C., a temperature range within which many high polymers exhibit first and second order transitions. Stretching is found to increase the rate of change of conductivity with temperature of both materials, but decreases the conductivity of GR-S. On lowering the temperature and raising it again, natural rubber exhibited a complicated hysteresis phenomenon, while GR-S showed a hysteresis loop caused by a second order transition near the brittle point. C—9.

X-Ray Crystallographic Studies of Compounds of Biological Interest. Robert B. Corey. *Annual Review of Biochemistry*, 1951, 20, pp. 131-148. This

is a review of the literature for the period 1948 to 1950. There are seventy-six references, some of which relate to macromolecules and miscellaneous fibres. C—9.

Chi-Square Distribution. Léon Goossens. *Rayonne*, 1950, **6**, No. 5, pp. 141, 143, 145-152. In French. The author discusses the analytical properties and applications of chi-square, χ^2. C—9.

On Certain Non-Linear Differential Equations with Almost Periodic Solutions. G. A. H. Reuter. *J. London Math. Soc.*, 1951, **26**, Part 3, No. 103, pp. 215-221. The equation $\ddot{x}+kf(x)\dot{x}+g(x)=kp(t)$ is dealt with, and it is shown that if $p(t)$ is almost periodic, $f(x)>0$, and $g(x)$ changes sign with x, there is an almost periodic solution. Some other results are also proved. C—9.

Rapid Estimation of the Mean Standard Deviation by the Benson Method. Léon Goossens. *Rayonne*, 1950, **6**, No. 6, p. 97. In French. This is an extension to the discussion on simple methods for determining the standard deviation in a series of measurements. (*J. Textile Institute*, 1950, **41**, A313.) C—9.

Tables of the Binomial Probability Distribution. National Bureau of Standards. Washington: U.S. Government Printing Office, 1950, x+387 pages. These tables were prepared for limited distribution in mimeographed form by a branch of the U.S. Army just after the close of World War II. The present volume, issued as Applied Mathematics Series 6 of the National Bureau of Standards, is a photographic reproduction of the mimeograph, with a new introduction. C—9.

[**Wool:**] **The Epicuticle and Allwörden's Reaction.** ("Die Epikutikula und die Allwördensche Reaktion.") H. Zahn. *Melliand Textilber.*, 1951, **32**, 419-420. The so-called epicuticle, revealed by various investigators under the electron microscope, is regarded as identical with Müller's scale cell membrane (*J. Textile Institute*, 1939, **30**, A656). The name "epicuticle" is claimed to be unsatisfactory, and alternative nomenclature is suggested. This membrane has now been isolated by Zahn under the phase contrast microscope. The membranes are 10-30 μ. long, and free from scales. They contain no cystine, tyrosine or histidine. Full details will be given in a further communication. W—9.

Oxidising Agents: Reaction with Wool. P. Alexander, M. Fox, and R. F. Hudson. *Biochem. J.*, 1951, **49**, pp. 129-137. Alkaline solutions of potassium permanganate or sodium hypochlorite produce lanthionine from 30 per cent. of the combined cystine in wool. Acidic potassium permanganate also oxidises 30 per cent. of the cystine to cysteic acid and sulphate. Acid solutions of chlorine and peracetic acid oxidise all the cystine; cysteic acid is not formed but is obtained on subsequent acid hydrolysis. It is suggested that a mixed imide of a carboxylic and sulphonic acid is produced. The action of alkali on wool oxidised with peracetic acid is interpreted as the hydrolysis of this compound to give a sulphonamide. Hydrochloric acid hydrolysis of the sulphonamide gives cysteic acid and all the amino-acids of wool, showing that cystine is combined with all the various amino-acids in the fibre. A partially oxidised product derived from cystine, probably a sulphoxide, is formed to a limited extent by a side reaction. W—9.

Specific Gravity Gradient Column: Application to the Quantitative Determination of Additives in a Base Material. C. R. Stock and E. R. Scofield. *Text Res. J.*, 1951, **21**, 521-526 and *A.S.T.M. Bull.*, July, 1951, No. 175, 78-81. The requirements for, and limitations of, a method of quantitative estimation of additives in a base material, measured by differences in density, are set forth. The specific gravity gradient column of Linderstrøm-Lang is described and discussed in terms of its range, sensitivity, stability and calibration. The bearing which these factors have on the method is illustrated by an example in which the concentration of a melamine resin, applied to a wool flannel for control of shrinkage, is determined. W—9.

Methacrylamide in Wool: A Study of Polymerisation. N. K. Boardman and M. Lipson. *J. Soc. Dyers Col.*, 1951, **67**, 271-274. Methacrylamide has little affinity for wool, maximum absorption from a 4 per cent. solution being 2·6 per cent. of weight of wool. Absorption equilibrium is attained in about 16 hours, the activation energy for a 4 per cent. solution being 800 g.-cal./mole. The rate of absorption appears to depend on diffusion through the fibre surface. Wool containing polymethacrylamide has an increased rate of absorption for

the monomer, the activation energy being 8,000 g.cal./mole. Polymer formation in excess of the maximum absorption of monomer can occur in wool and the mechanism of this phenomenon is discussed. W—9.

Wool in Solutions Containing Salt and Acid: Some Tensile Properties. H. Bogaty, A. M. Sookne and M. Harris. *Text. Res. J.*, 1951, 21, 479-481. Wool fibres are more easily stretched in 0·1N—HCl than in water, whilst the length recovery on retraction is the same. The opposite result is obtained with 4M—KCl. Fibres extended in mixtures of 0·4MKCl and 0·1N—HCl are stretched more easily than in salt alone but give lower length recovery on retraction. Increasing the temperature of the salt/acid mixture gives an improved recovery of work for extensions and recovery of initial length. Concentrated LiBr solutions show a similar result to the mixed salt/acid solution. The results are explained on the basis of swelling in acid and depression of molecular mobility by the concentrated salt solution. W—9.

Wool Wax. (1) Synthesis of Some *anteiso*-Acids. J. R. Nunn. *J. Chem. Soc.*, 1951, July, pp. 1740-1744. Experimental details are given of syntheses of 8-methyldecanoic, 9-methylundecanoic, 10-methyldodecanoic, 12-methyltetradecanoic, 14-methylhexadecanoic, and 18-methyleicosanoic acids in their racemic forms. The long X-ray crystal spacings of the amides and solid acids are recorded. W—9.

Infra-red Spectroscopic Studies of Globular Protein Structure. E. J. Ambrose and A. Elliott. *Proc. Roy. Soc.*, 1951, **A, 208**, 75-90. The infra-red absorption bands associated with the peptide groups in globular proteins, folded synthetic polypeptides and α-fibrous proteins are very similar. The spectra of denatured globular proteins, extended chain synthetic polypeptides and β-fibrous proteins are also very similar. Denatured fibrous insulin is shown by polarised-beam techniques to consist of extended β-chains lying perpendicular to the fibril axis, with a layer structure involving inter-chain hydrogen bonded grids. Rhombohedral insulin crystals show dichroism consistent with an arrangement of folded chains packed perpendicular to the trigonal axis. A mechanism to explain denaturation of proteins is suggested in which precipitation is caused by a change from *intra*-chain to *inter*-chain hydrogen bonds. A method for investigating chain configurations of proteins in aqueous solution is described. W—9.

"The Sub-cuticle Membrane—A Recently Discovered Morphological Component of the Wool Fibre." (1) N. Gralén, G. Lagermalm and B. Philip; (2) P. Alexander, H. Zahn and H. Haselmann; (3) N. Gralén, G. Lagermalm and B. Philip. *Text. Res. J.*, 1951, 21, 234-236, 236-238, 238. (1) A sample of the membrane isolated by Alexander and Earland (*J. Textile Institute*, 1951, 42, A42) has been examined under the electron microscope. Photographs show a specimen treated with ultrasonics and shadowed with palladium. There is no indication that this membrane is identical with the "subcutis" of Reumuth, Lehmann, and Elöd and Zahn.

(2) Comments, stressing the question of nomenclature.

(3) Additional comments.

(The same article appears in German in *Melliand Textilber.*, 1951, 32, 350-352). W—9.

Recrystallisation of Relaxed Animal Fibres. L. G. Jagger and J. B. Speakman. *J. Textile Institute*, 1951, 42, P771-P782. After extension in water at ordinary temperatures, animal fibres, such as wool and hair, return to their original lengths on being released, even when the fibres have been weakened either by rapid stretching to extensions beyond 30 per cent., or by relaxation at 50 per cent. extension. In both cases, weakening is believed to be due to molecular disarrangement and disulphide bond breakdown, the former being the more important in relaxed fibres and the latter in fibres stretched rapidly to high extensions. Molecular rearrangement, as evidenced by re-strengthening of the fibres, is promoted by heat-treatment, maximum recovery being obtained in water (*pH* 6) at 72° C. in 13 hours. W—9.

Wool: Action of Chlorite and Chlorine Dioxide (A, B, and C). C. Schirlé and J. Meybeck. *Compt. rend.*, 1951, 232, 526-528, 732-733, 1219-1221 (through *Chem. Abstr.*, 1951, 45, 4933, 5413, 5933). (A) Quantitative studies show that the action of dilute solutions of chlorite on wool causes greatest conversion of cystine to cystein at *pH* 3·5. With a more concentrated solution of chlorite and

solutions of ClO_2, cystine and tyrosine are removed from the wool. (B) In the study of the browning of wool treated with chlorite, and ClO_2, the oxidation of pure tyrosine under the same conditions was investigated. Results were very similar to those described by Raper (*Biochem. J.*, 1926, **20**, 735; 1927, **21**, 89). The reaction with wool is more complex. (C) In cold aqueous solution, chlorite and ClO_2 reacted with tryptophan (R_F value in phenol 0·78) to give a colour reaction, first pink, then vivid red, and the product gave positive ninhydrin test and R_F value 0·55. A more concentrated oxidising medium gave a complex mixture. Tryptophan and tyrosine in oxidised wool were determined by vanillin and mercuric nitrite procedures. With chlorite in the cold, concentration of tryptophan and tyrosine decreased as *pH* decreased; with aqueous ClO_2 concentration of tryptophan and tyrosine decreased as ClO_2 increased. Pink wool (prepared by treatment of wool with cold chlorite at *pH* 3·5) contained less tryptophan, but the same amount of tyrosine, than did untreated wool. W—9.

Skin: Sedimentation Analysis of an Extract of the Prekeratinous Layers. E. H. Mercer and B. Olofsson. *J. Polymer Sci.*, 1951, **6**, 261-269. The examination of aqueous urea extracts of the thickened skin of nose and lip of the cow by sedimentation, diffusion and electrophoresis confirms the existence of precursors of keratin. Three or more components appear to be present. Reduction of the extract by sodium bisulphite results in a single component of low sedimentation constant. The data for one of the initial components indicate a molecular weight of approximately 60,000. It is concluded that the precursors contain relatively few disulphide bridges and that the conversion into insoluble keratin is due to consolidation by the formation of disulphide bridges. The bearing of these findings on the *in-vivo* synthesis of keratins is briefly discussed. W—9.

Microbiological Method for the Determination of Sequence of Amino-acid Residues. S. W. Fox, T. L. Hurst, and K. F. Itschner. *J. Amer. Chem. Soc.*, 1951, **73**, 3573-3575. A subtractive microbiological method for the determination of terminal amino-acid residues in peptides is described and exemplified by various di- and tripeptides. Selective hydrolysis permits determination of the sequence of residues in a tripeptide. When employed comparatively with paper-strip procedures, the method serves to indicate D-residues. W—9.

Hygroscopicity of Amino-acids and its Relationship to the Vapour Phase Water Absorption of Proteins. E. F. Mellon and S. R. Hoover. *J. Amer. Chem. Soc.*, 1951, **73**, 3879-3882. The effect of polar groups with vapour phase water absorption, already studied in proteins, is now examined in a number of model substances, *viz.*, amino-acids, and simple peptides and other amino-acid derivatives (*e.g.* benzoylglycylglycine, carbobenzyloxyglycine). With these substances and under conditions where the polar groups can be expected to be very highly co-ordinated into the crystal structure, little absorption of water occurs, even at high humidities. However, with these relatively simple substances, all types of water absorption phenomena, including hysteresis, can be demonstrated. The results show that the polar groups of proteins must be comparatively unco-ordinated and completely available to water molecules. In general, the polarisation theory of absorption is adequately supported. W—9.

Acids: Separation by Paper Partition Chromatography. A. G. Long, J. R. Quayle and R. J. Stedman. *J. Chem. Soc.*, 1951 (Aug.), pp. 2197-2202. The use of various basic solvent systems (*e.g.*, ethanol-morpholine) for the paper partition chromatography of some organic acids is investigated and a method evolved for their separation. The study is extended to include anions of amino-acids of organic, partly esterified phosphoric and sulphonic acids, as well as phenols and metallic cations. The application of the method to oxidative degradation studies is indicated. W—9.

Fibrin Clotting: Effect of Ions and Neutral Molecules. J. T. Edsall and W. R. Lever. *J. Biol. Chem.*, 1951, **191**, 735-756. The rate of formation of fibrin clots from fibrinogen and thrombrin and the modifications in the structure of the clots by variation of *pH* and ionic strength, and by the addition of certain ions and neutral molecules at constant ionic strength are investigated. Special attention is given to the action of urea and guanidine and it is shown that several reagents which inactivate thiol groups have no observable influence on the clotting process; some evidence is presented, however, that dithio linking is involved in the structure of the clots when calcium ions are present. W—9.

Spectrophotometric Analysis of Amino-acids and Peptides with their Copper Salts. J. R. Spies and D. C. Chambers. *J. Biol. Chem.*, 1951, 191, 787-797. A simple and rapid spectrophotometric method is described for determining amino-acids and peptides based on the colour obtained when copper combined with the amino-acids and peptides is converted into the copper salt of alanine. The method is applicable to studying the rate of protein hydrolysis. Application of the method is exemplified by comparison of the values for chromogenic nitrogen found and calculated for complete acid hydrolysates of casein, β-lactoglobulin and a cotton-seed protein based on their amino-acid contents. W—9.

Small-scale Filter Paper Chromatography. L. B. Rockland, J. L. Blatt and M. S. Dunn. *Analyt. Chem.*, 1951, 23, 1142-1146. The material conditions for filter paper chromatography are investigated. Thirteen types of filter paper are rated for chromatographic work on the basis of their physical and chemical characteristics and the effect of the paper on the R_f values of 18 amino-acids is determined. Other factors investigated include the effect of water-content of various water-miscible solvents, the nature of the amino-acid, and the selection of solvents with reference to the nature of the desired chromatographic separation. W—9.

Fibrous Proteins: Structure. (I) New Polypeptide Structure of α-keratin. Y. Kanda. *Bull. Chem. Soc. Japan*, 1950, 23, 4, 137-141. (In English) (through *Kodak Mo. Abstr., Bull.*, 1951, 37, 240). The author proposes a new model of α-keratin which is based on assumed bond lengths and bond angles. The model is a folded-type chain which gives the correct identity distance along the chain. Hydrogen bonds between the α-carbon atom of a given peptide unit and the α-amino-nitrogen atoms of the next peptide unit of the same chain are proposed. Intrachain hydrogen bonds between carbonyl oxygens of the main chain and α-amino-nitrogens are not permitted by the model. W—9.

Fibrous Proteins: Structure. (II) New Polypeptide Structures of β- and Feather-Keratins, and Three Silk-Fibroins of *Bombyx mori*, *Saturniinæ* [*Antheræa*] *pernyi*, and *Antheræa mylitta*. Y. Kanda. *Bull. Chem. Soc. Japan*, 1950, 23, 4, 142-146. (In English) (through *Kodak Mo. Abstr. Bull.*, 1951, 37, 240). Using the assumptions of the previous paper (*Ibid.*, 1950, 23, 4, 137-141), the author proposes models for the structures of these fibres which account for their identity distances as measured by X-ray diffraction. W—9.

PATENT

Keratinous Materials: Recovery of Protein from— E. C. Koerner. U.S.P. 2,535,684 of 26/12/1950. Keratinous materials are treated with either 12-14N-phosphoric acid or 8-9N-sulphuric acid, before being reduced by dispersion in an alkaline sodium sulphide-sodium sulphoxylate solution. Only a negligible loss of keratin occurs, and there is no salt formation between the acid and the keratin. The mechanism of the conversion of the cystine linkage into cystine is described. W.

10—ECONOMICS

Ceiling Price Regulations [for Cotton] in U.S.A. Anon. *Text. Wkly*, 1951, 47, No. 1208, pp. 1290, 1292. Short extracts are given from the U.S.A. Government Order which brought into force "CPR 8", the cotton price regulation for American Upland cotton. C—10.

Cotton Quality Statistics: United States 1949-50. U.S. Dept. of Agric. Production and Marketing Administration, Cotton Branch. *Statistical Bulletin*, No. 94, Washington D.C., 1951, ii+63 pages. This report contains information on the quality of cotton ginned during the 1949-50 season, and on the quality of cotton on hand in the United States on August 1, 1950. The information is contained in tables and maps relating to the United States as a whole, to the individual states, to the "carry-over", and to "supply and disappearance". C—10.

Davison's Rayon and Silk Trades. New Jersey, Davison Publishing Co., 1951, 528 pages. This directory of textile firms in the United States and Canada, includes information about manufacturers (concerned with silk, rayon, nylon, and other synthetic fibres), throwsters, dyers, finishers, printers, and converters. C—10.

Evaluation of Internal Efficiency of a Mill. R. Richter. *Textil-Praxis*, 1948, 3, No. 12, pp. 379-382. In German. The author discusses methods of observing the efficiency of workers and machinery. **C—10.**

The Grading of Cottonseed. Marion E. Whitten. *U.S. Department of Agriculture Information Bulletin*. No. 39, 1951, 66 pages. **C—10.**

Industrial Productivity Committee's Report for 1949. Anon. *Nature*, 1950, 166, No. 4233, pp. 1024-1025. A brief account is given of the second (and final) report of the Committee on Industrial Productivity, which covers the work of the Committee during 1949. **C—10.**

Quality and Costs. Otto Zollikofer. *Industrielle Organisation* (*Zurich*), 1951, 20, No. 1, pp. 1-8. In German. (Through *Management Abstr.*, 1951, 4, No. 3, pp. 85-86.) In a series of experiments at the works of Sulzer Bros. (Winterthur, Switzerland), a firm building medium-size machines, costs were found to rise with progressively finer tolerances allowed on turning and grinding shafts and bores. A critical point was reached beyond which each reduction in tolerance entailed a major increase in manufacturing time. In many cases an alteration of the basic design eliminated the need for extreme accuracy. **C—10.**

Market Outlets for Extra Long Staple Cotton in the United States. Joe H. McLure. *Agriculture Information Bulletin*, No. 33. Washington D.C., 1951. 50 pages. This report is concerned with cotton having a staple length of 1⅛ inches and longer. It deals with uses, sources of supply and consumption; qualities and processing results for certain varieties, and in specified products; quantity available, Government action, substitutability of other fibres, price relationships, and general economic and business trends. There are thirteen references. **C—10.**

Piece-Rates and Production Efficiency Calculations in the Spinning Mill. Helmut Bihler. *Textil-Praxis*, 1948, 3, No. 12, pp. 386-389. In German. **C—10.**

Report on the Accuracy of the All-India Cotton Forecast of 1946-47 Season. Indian Central Cotton Committee. *Statistical Leaflet*, No. 5, 1950, 11 pages. **C—10.**

Report on the Staple Length of the Indian Cotton Crop of 1948-49 Season. Indian Central Cotton Committee. *Statistical Leaflet*, No. 1, 1950, 7 pages. **C—10.**

Textile Research Achievements—1949. Anon. *Rayonne*, 1950, 6, No. 5, pp. 67, 69-70. In French. This review includes fifty references. **C—10.**

World Textile Directory. Anon. New York: Atlas Publishing Co., 1950, 646 pages. This is the first edition of a new directory in which the aim is to compile a comprehensive list of firms located in all parts of the world that do an export and import business in wool, cotton, rayon, silk, and bast fibres, including raw materials, wastes, and textile goods, and also of firms who are manufacturers of textiles. The firms are listed (name and address) in sections, alphabetically, according to country and town, and extensive use is made of code letters and numbers to indicate different activities. **C—10.**

Camara Algodonera del Peru Memoria Annal 1950. Lima: Republica del Peru, [?1951], 93 pages. In Spanish. This report on Peruvian cotton gives official statistics for the year 1950. **C—10.**

Motion Study: Fundamentals. Anne Shaw Organization. *Text. Merc.*, 1951, 125, No. 3248, pp. 7, 9. A brief report is given of a one-day conference on "Motion Study Today", organized by the Anne Shaw Organization, which was held in Manchester on June 28th. **C—10.**

The Indian Cotton Textile Industry 1851-1950. M. P. Gandhi (Editor). Bombay: Gandhi, 1950, 150+one hundred and sixty-eight+xx pages. The three sections of this centenary volume consist of advertisements, short articles on the structure and development of the Indian textile industry, and an appendix giving details of the cotton mills in India. **C—10.**

Methods of Operations Research. P. M. Morse and G. E. Kimball. New York: Wiley, 1951, vii+158 pages. "Operations research is a scientific method of providing executive departments with a quantitative basis for decisions regarding the operations under their control," says this book. The authors' declared aim is to show how the techniques can be applied to any field—industrial, governmental, or military. After an introduction, the different chapters deal with

probability, the use of measures of effectiveness, strategical kinematics, tactical analysis, gunnery and bombardment problems, operational experiment with equipment and tactics, and organisational and procedural problems. There are tables, a bibliography, and an index. **C—10.**

Motion Study in Worsted Spinning, 36 pages, and **Motion Study in Woollen Spinning,** 40 pages. Bradford: The Wool and Allied Textile Employers' Council, 1951. These pamphlets describe pilot mill experiments initiated by the Joint Advisory Committee to test the value of motion study. **C—10.**

Skinner's Cotton Trade Directory of the World 1951. Manchester: Skinner, 1951, clxxii + 1554 pages. The 27th edition of this international directory lists cotton (and waste) merchants; spinners, manufacturers and doublers; yarn and piece goods finishers; and merchant converters. There are sections concerning silk and rayon, and linen, flax and jute; there are also lists of packers, directors, fabrics and their manufacturers and merchants, trade marks, and mill supplies and suppliers. The introductory section, in addition to listing associations, laboratories, and technical colleges, includes detailed statistics regarding cotton production and prices. **C—10.**

Some Relations, Economical and Technical, between the Pulp and Paper Trade and the Textile Trade. G. Ullmann. *J. Soc. Dyers Col.*, 1950, **66**, No. 11, pp. 576-578. The author comments in a general way upon relationships between paper and textiles. 1948 world production figures for textiles and pulp are noted, together with the enormous *per capita* consumption of both in the U.S.A. Briefly noted are the invasion paper is making into the field of textiles, the many new uses of paper (such as paper dusters, curtains, pillows and seat covers), and the new "flock" paper for window decoration. Comparison is made of chemical processes, dyeing, mechanical finishes, and pre-treatment, in the two trades. Several methods of pre-treating raw pulp materials, for the production of rayon pulp and paper pulp, are discussed. A new acid after-treatment of pulp is reported, which leaves the fibre strong and sufficiently free from starch, and which may even be satisfactory for textiles. **C—10.**

The Travancore Rayons Limited. *Indian Text. J.*, 1951, **61**, February, pp. 297-362. This is a profusely illustrated article on India's first viscose rayon factory, newly opened. The factory is situated in the industrial area of North Travancore, on the Perijar River, near virgin forests which, it is hoped, will ultimately provide the principal raw material in the form of *Eetla* bamboo. Separate sections describe the building and engineering work, the manufacturing process, the transparent paper section, the laboratories, and the boiler, power, ventilation, refrigeration, water treatment and filtering, and calcination plants. **C—10.**

Australian Wool Industry. A. R. Callaghan. *J. Dept. Agric. S. Australia*, 1950, 54, 55-61. Figures are given showing the importance of wool to Australian economy and to world production and consumption of wool. The prospects of a continuation of high wool prices are assessed, competition with other fibres being discussed. **W—10.**

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY, AND EDUCATION

Alphabetical Arrangement. British Standards Institution. *British Standard 1749*, 1951, 12 pages. This standard applies to the arrangement of entries in alphabetical lists. It is divided into four sections: General, Order of Words and Groups of Words, Nomenclature of Complex Items, and Order of Complex Items. The presence of accents, diacritical marks and apostrophes should not affect the order; in groups of words, the "nothing-before-something" principle applies; and prefixes to names such as "Mac" or "Saint", which may occur in contracted forms, should be arranged as if spelt in the fullest form. **C—11.**

Annual Reports of the Progress of Chemistry for 1950. Vol. XLVII. London, Chemical Society, 1951, 490 pages. This volume contains thirty-one review papers in sections on general and physical chemistry, inorganic chemistry, organic chemistry, biochemistry, analytical chemistry, and crystallography. **C—11.**

Chemical Progress during the Seventy-five Years of the American Chemical Society. American Chemical Society. *Ind. Engng Chem.*, 1951, 43, No. 2, pp. 266-314. A short account of the origin and development of the American Chemical Society is followed by reports of a general nature on the progress during the past seventy-five years of the several branches of the chemical industry. These reports embrace: Physical and Inorganic Chemistry by L. F. Audrieth and F. Daniels; Organic Chemistry by H. L. Fisher; and Industrial and Engineering Chemistry, edited by W. A. Pardee. The latter is a co-ordination of the following sub-sections: Unit Operations by T. H. Chilton, Unit Processes by R. N. Shreve, Materials of Construction by L. T. Work, Electrochemical Industry by R. M. Burns, Dyestuff Industry by L. H. Flett, Leather Making by H. G. Turley, and Glass and Ceramics by E. W. Tillotson. The first Division of the Society—that of Industrial Chemists and Chemical Engineers—came into being in 1907. The account ends with a report on Fertilizer Chemistry by F. S. Lodge. C—11.

A Dictionary of Science. E. B. Uvarov and D. R. Chapman. Harmondsworth, Penguin Books, 1951, 240 pages. The declared aim of this small dictionary is to define and explain, for the benefit of the layman and the student, terms used in chemistry, physics, and elementary mathematics. C—11.

The Fatigue Allowance. Richard F. Bruckart. *Time Study Engr*, 1951, 6, No. 3, pp. 78-84. The outline of a method for determining fatigue allowance is set forth. The fatigue allowance is based on the job and not on the worker. An analysis is made of working conditions which cause fatigue, and the method seeks to establish the relative degree to which each of these conditions brings about a decrease in worker productivity. C—11.

Air-Borne Cotton Dust: Measurement of Concentration. P. F. Holt. *Text. Mfr*, 1951, 77, March, pp. 132-133. This article describes briefly a technique used to determine the amount of cotton dust in the air in cotton mills. C—11.

Industrial Diseases: Prevention. R. Murray. *Text. Wkly*, 1951, 47, No. 1209, pp. 1364, 1366, 1368. This is a lecture given by H.M. Medical Inspector of Factories. C—11.

Chemical Literature: A Short Guide. G. Malcolm Dyson. London, Longmans, 1951, viii + 144 pages. The declared purpose of this book is to supply an introduction to the literature of chemistry, for students and research workers. There are chapters on dictionaries and encyclopædias, chemical journals and periodicals, abstract journals, textbooks and special works of reference, works of reference on medicinal chemicals, and on making a search of the literature. Three appendices deal with some old and obsolete journals, an example of an organic chemical search, and tables showing the year and volume number of the main chemical publications; and there are author and subject indexes. The second chapter includes a section on Dyes and Textiles, but lists only the *Journal of the Textile Institute, Zellwolle, Wool Record and Textile World, Textile Age, Textile Mercury and Argus*, the *Journal of the Society of Dyers and Colourists*, and *Revue Generale des matières colorantes, du blanchiment, etc.* (sic). C—11.

The Journal, Session 1949-1950. Bradford: Bradford Textile Society [?1950], 104 + lxxx pages. The latest issue of this characteristically well produced and well illustrated annual includes accounts of lectures by Thomas L. Leckie on Printing of Fabrics, and by W. H. Hillier on The Treatment of Sewage Containing Textile Trade Effluents. C—11.

Industrial Dust: Measurement and Examination with Special Reference to X-Ray Analysis as a Tool in Medical Research. H. Gärtner. *Schriften a.d. Hyg. Inst. Landesuniversität in Münster (Westf.)*, 1947, No. 3, 144 pp., 24 figs. (through *Bull. Hyg.*, 1951, 26, No. 1, p. 53). This book summarises the methods which have been used to describe, sample and examine industrial dusts which cause lung disease. Ways of recognising particles in lung tissue are referred to, and chemical treatments for the isolation of lung dust are listed. An account is given of the application of X-ray diffraction to mineral analysis, particularly in lung residues. There are six pages of references. C—11.

Protective Clothing for Work with Mercury and Its Cleaning from the Latter. K. V. Migai. *Gigiena i Sanit.* [*USSR*], 1950, No. 6, pp. 17-20 (through *Chem.*

Abstr., 1951, 44, No. 21, p. 10213[5]). Static vapour permeability tests showed that all cotton, flax and wool fabrics are penetrated within 1-2 hours; rubber-treated and plastic-treated cloths are penetrated in 3-5 hours. The best protective fabric was one (not described) developed by the Kharkov Industrial Health Institute, which gave no penetration for 3-5 days. Since all fabrics are permeable to vapours, the ease of contamination by the metal is the only controllable factor; for this, tightly woven cotton fabrics are the best, and these are recommended. Directions for washing are supplied. C—11.

Wool Research: Trends. R. J. Bray and E. G. Carter. *J. Textile Institute*, 1951, 42, P361-P384. After a brief account of research activities in the wool industry, outstanding achievements in fundamental and applied research are reviewed. These include investigations on the structure and physical properties of the wool fibre, and on scouring and by-product recovery, carding, combing, drawing and spinning, fabric production, finishing processes, and the physical and chemical changes occurring during wool manufacture. Present trends in the development of wool research are indicated. W—11.

12—CONFERENCES AND EXHIBITIONS

Exposition Textile Internationale, Lille, 28 Avril-20 Mai, 1951, Album Général. Paris, Editions de L'Industrie Textile, 1951, 241 pages. In French. This detailed catalogue of exhibits at the Lille Textile Exhibition, 1951, contains sections on grading and testing, spinning, preparation, weaving, knitting, finishing of yarns and fabrics, making-up, and management and working conditions (lay out, mechanical handling, air conditioning, *etc.*). C—12.

Control of Yarn Quality. Institution of Electronics. *Text. Merc.*, 1951, 125, No. 3252, pp. 204-205, 207. A brief account is given of some of the exhibits shown at a recent exhibition of electronic instruments. These include the Fielden Walker yarn evenness tester, the Fielden mean deviation meter (which automatically and continuously measures one centimetre lengths of yarn), a draw force tester, an instrument for measuring the rate of wetting of materials, and an electronically controlled reel drive. C—12.

International Congress on Analytical Methods, Paris, 1950. Clément Duval. *Mikrochem.*, 1951, 38, Nos. 1-2, pp. 168-171. In French. Brief surveys are given of papers read at the Congress, which was held in conjunction with the revived Annual Scientific Exhibition organized by the "Societé de Chimie industrielle". The subjects covered were divided into five sections: (1) apparatus; (2) physico-chemical techniques; (3) mineral analysis; (4) organic analysis; (5) biochemical analysis and hygiene. C—12.

International Microchemical Congress at Graz (Austria), July, 1950. Austrian Society of Microchemistry. *Mikrochem.*, 1951, 36/37, 1192 pages. At this conference sixty-eight papers on general microchemistry and fifty-nine on applied microchemistry were read. The papers are in English, French, or German, but each has a summary in all three languages. Nineteen of these papers are reported in these abstracts. C—12.

New Apparatus: Scientific and Technical Group's Review of — J. L. French. *Photogr. J.*, 1950, 90, Section B, No. 6, pp. 172-175. The Group's third review of new apparatus took place in May, 1950, and included exhibits of the following: a new Colour Temperature meter by Megetron; a vacuum cell photometer by Baldwin Instruments Ltd.; transmission and deflection densitometers by Baldwin Instruments Ltd.; the EEL universal densitometer; a clinical camera by Messrs. Instrument Developments; a copying stand by the same firm; an intra-cavital illuminator, with kine camera mounted with it, from the Christie Hospital, Manchester; a Flash Press camera by Dawe; underwater filming equipment; flash-tubes from the General Electric Co.; a Reflex 35 mm. camera; range-finders by Dodin of Paris; a very small exposure-meter by Pullin Optical Co. Ltd.; enlargers and a tripod by the same firm; time-lapse equipment by Simpl Ltd., and the Plessey high-temperature vacuum X-ray spectrographic camera. Details are given, with a short appraisal. (The Group referred to in the title is the Scientific and Technical Group of the Royal Photographic Society.) C—12.

National Hosiery Manufacturers' Federation: Conference. *Hosiery Times*, 1951, 24, (264), 11-19, 48-55, 80. Report on the National Hosiery Manufacturers' Federation Conference at Harrogate. Subjects of papers and discussions included raw material supplies, electronics in the hosiery industry, snagging problems in 15 denier nylons (P. J. Doyle); and wool/synthetic fibre blends (W. A. Dutton). H—12.